Site Work Plan
PCB Transformer Removal and Cleanup
Country Club of the Pacific
Yona, Guam

February, 2014

Prepared for:

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1.0 INTRODUCTION

This Work Plan (WP) has been prepared by Unitek Environmental Guam (Contractor) for the Country Club of the Pacific (CCP). This Work Plan addresses the removal of 3 each polychlorinated biphenyl (PCB) containing transformers and the cleanup, excavation and transport of soil contaminated with PCBs at CCP in Yona, Guam. Initial testing of oil from one of the transformers indicated PCBs were present at a concentration below 500 ppm. Further testing conducted of the oil contained within the disposal drums for waste characterization identified the three abandoned transformers at the site actually contained oil with concentrations of PCBs of 1450 ppm , 2550 ppm and 1570 ppm. The transformer identified as Transformer 1 (serial# 07291763) did not have signs of any oil leaks and the amount of oil removed and containerized was close to the amount listed on the data plate. The other two transformers were found with oil stains outside the transformers and with less oil inside than indicated on the data plate. After removal of all liquids from the subject transformers into DOT approved drums for disposal, it was estimated that the amount of oil removed was estimated approximately 100 gallons less than was listed on the data plate for Transformer #3 (serial # 07291765) and approximately 45 gallons less than was listed on the data plate for Transformer #2 (serial # 07291764) (Unitek, December, 2013). Based on the data plate information, the transformers are of Japanese manufacture by Kitashiba Electric Co. LTD of Japan in 1972. Laboratory analysis of the oil indicated PCBs of Japanese origin resembling laboratory standards for PCB oil products known as Kanechlor-300 and/or Kanechlor-400.

The objectives of this project are to properly remove and dispose of the three PCB transformers, dispose of PCB containing oil/water/soil, and restore the site so that surface and subsurface PCB concentrations in soil are below the Toxic Substance Control Act (TSCA) Low Occupancy Area, Title 40 Code of Federal Regulations (CFR) 761.61 cleanup criteria of 25 mg/kg (50 or 100 mg/kg with site controls). CCP Golf course meets the definition of a low occupancy area in 40 CFR Part 761.3 where occupancy for any individual not wearing dermal and respiratory protection for a calendar year is less than 355 hours (average of 6.7 hours per week) per year. Successful completion of this project will eliminate the potential PCB source from the site, prevent further migration of contaminants at the site and will mitigate potential risk to site users and ecological receptors from exposure to PCBs.

1.1 Site Location and Background

The CCP golf course is located in Yona, Guam near Guam's southeastern coast. The location of the golf course is shown in Figure 1. Figure 2 shows the approximate locations of each of the transformers at CCP. Figure 3 shows the topography in the vicinity of the transformers at CCP.

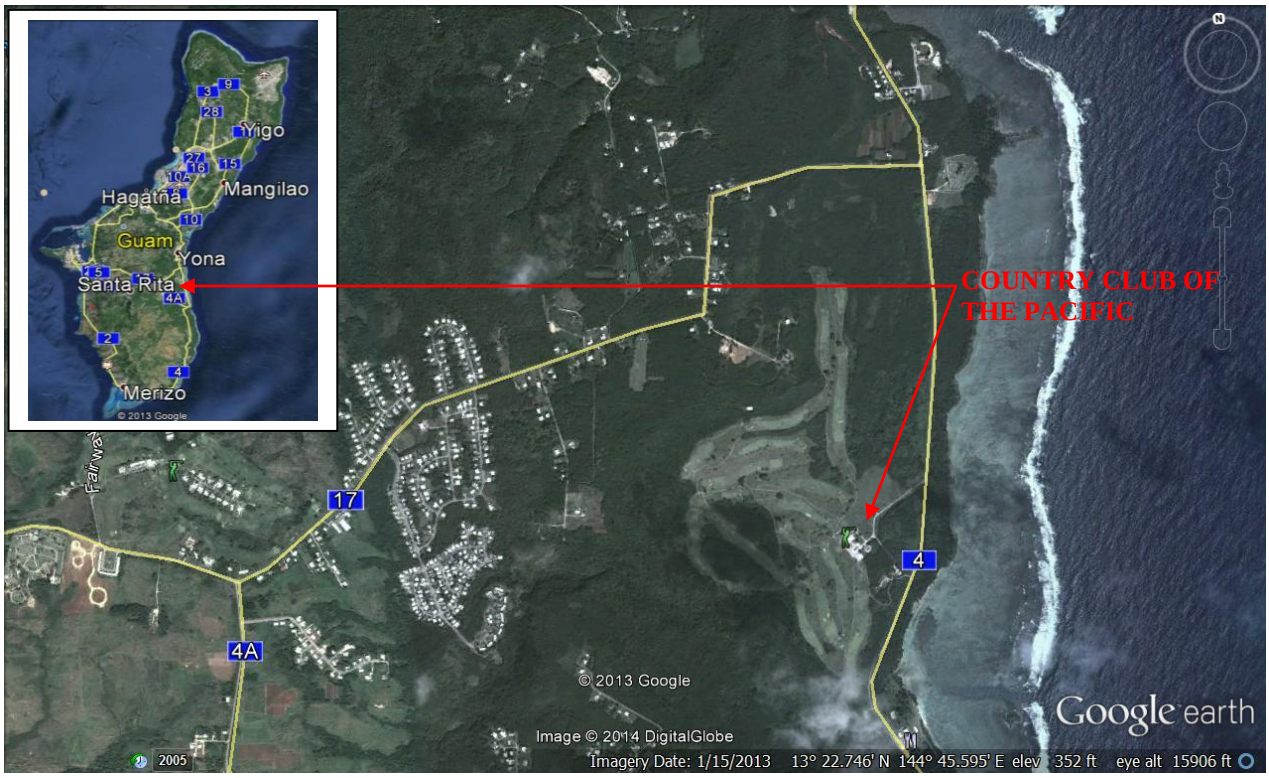

Figure 1. Club of the Pacific Location Map.

Figure 2. Locations of 3 CCP Transformers.

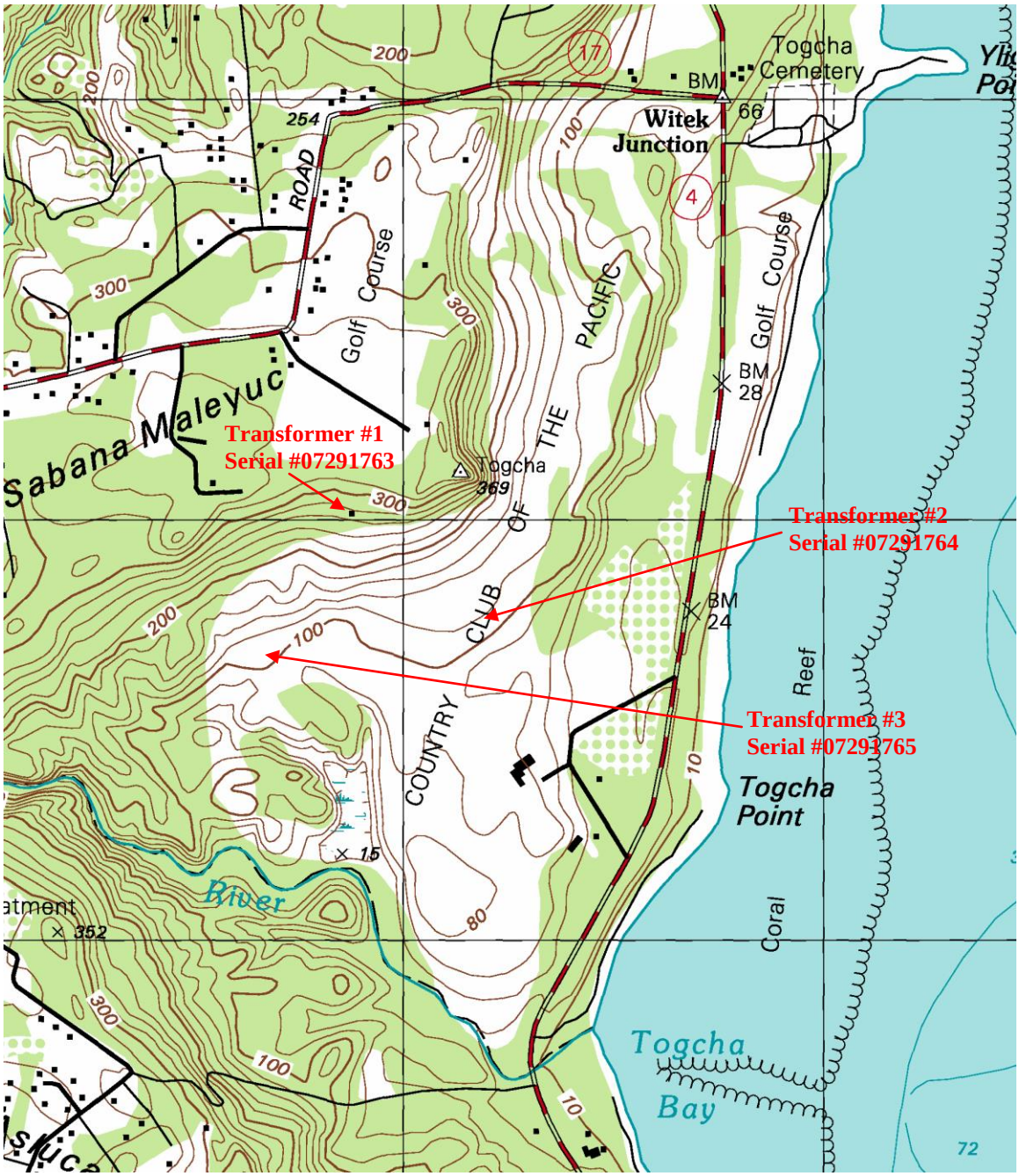

Figure 3. Topographic Location Map for CCP Transformers. USGS, 2000.

Construction of CCP was completed in 1973 by the Sobhu Guam Development Co Ltd. The golf course was later purchased in 2007 by P.H.R. Holding Guam, Inc. The 3 subject PCB transformers originally installed during construction of the golf course to provide electrical power service have been out of service since 1976. Recent observations at the site identified oil stains on the ground prompting response to address the transformers. Samples were collected in October, 2013 which identified the oil contained PCBs at a concentration below 500ppm.

Unitek Environmental-Guam, Inc. (Unitek) was retained by Country Club of the Pacific, Inc. (CCP) to drain and contain liquids contained inside 3 pad-mounted transformers in December, 2013. Unitek performed the removal and containment of transformer oils into 55 gallon drums to stop the releasing of oil to the environment and secured the transformers with poly sheeting to prevent further accumulation of rainwater into the transformers. The work was initiated on December 26, 2013 and completed on December 27, 2013.

1.2 Previous Investigations

- In October, 2013, South Pacific Environmental, Inc. collected samples at the 3 subject transformers. One contained oil and the other two were described as water. The samples were tested for PCBs. The oil sample analysis results indicated approximately 300 ppm PCBs and the two water samples were non-detect for PCBs.

- On January 3, 2014, after initial response to secure the site was complete, Unitek Environmental-Guam (Unitek) performed sampling and analysis of transformer oil recovered from three (3) Transformers at the Country Club of the Pacific. The objective of the testing was to determine the level of polychlorinated biphenyls (PCB)s contained in the oil for determination of proper disposal. All 3 samples were subjected to PCB analysis of oils via EPA method 8082 Modified. Results indicated that all three samples were positive for PCBs ranging from 1450 mg/l to 2550 mg/l making the oil and transformers regulated as PCB waste.

1.3 Site Characteristics

The climate of Guam is generally uniform throughout the year, with temperatures averaging about 30 degrees Celsius (C) during the day and 22-25 degrees C during the night. Relative humidity ranges from 60-100 percent. There are two primary seasons in Guam; a dry season from January through April, and a wet season from July to November. In between these two seasons are transitional seasons that may be wet or dry, depending upon the year. Mean annual rainfall on Guam ranges from approximately 250 centimeters on the windward side of the higher mountains to about 200 centimeters along the coast of the west side of the southern half of the island (Young 1988).

Soils at the golf course in the vicinity of all three of the transformers is classified as Pulantat clay with varying slopes. Pulantat clay soils are described as shallow well drained soils derived from limestone plateaus and hills and consist of approximately 18 cm or dark grayish brown silty clay over approximately 12 cm of brown clay (Young, 1988). Weathered limestone would be expected at a depth of approximately 30cm below the surface. Some variability in the soil thicknesses should be expected due to grading activities during construction of the golf course.

The limestone underlying the site is classified as Mariana limesone, Agana argillaceous member. This limestone is course to fine grained fossiliferous detrital limestone contain 2-5% clay overall with as much as 20% clay in pockets and cavities (Tracey et. al., 1964).

There are no surface water resources such as ponds, lakes, rivers, or the ocean in the vicinity of the transformers. Groundwater is anticipated approximately 100 feet below the ground surface near Transformer 2 and Transformer 3 based on topographic information and approximately 250 feet below grade in the vicinity of Transformer 1.

Land use of the area identified for removal action is within an operational golf course. CCP golf course was originally constructed in 1973 and has been in operation for 41 years. Most of the site was graded during construction and native species of plans have been replaced by grass and ornamental shrubs across the site. Golfers and grounds maintenance staff may have intimate contact with paved surfaces and soil at the site due to the nature of activities being performed but the time spent on site in the vicinity of Transformer 2 is almost nonexistent since it is located in an area not used for golfing. Transformer 3 is located near the bathroom facility near the center of the course making human receptors the primary concern as they transit through the area. Transformer 2 is located in a section of secondary forest dominated by thick Tangantangan (Leucaena leucocephala), an alien tree species introduced to the Marianas in the early 1900s which proliferated in Guam after World War II with it's use to curb erosion after the war). Ecological receptors at the site may include small fauna including, numerous species of gecko, skink, Green Anole, monitor lizards, land crabs, mollusks, amphibians, snakes, and forest birds. Large fauna receptors may include feral pig and Philippine deer (Vogt and Williams, 2004). CCP Golf course meets the definition of a low occupancy area in 40 CFR part 761.3 where occupancy for any individual not wearing dermal and respiratory protection for a calendar year is less than 355 hours (average of 6.7 hours per week) per year.

1.4 Scope of Work

The objective of the project is to remove PCB transformers, oil and PCB impacted concrete/soil. All required planning documents will be prepared and approved prior to the start of field operations. There are small concrete pads under each of the transformers. The impacted concrete pads will be broken and packaged along with visually contaminated soil adjacent to the pads and possibly underneath for disposal at a permitted US mainland disposal facility. The impacted concrete pads and soil will be packaged into 10 each 1-cubic yard bulk sacks. The impacted pads and visually impacted soil will be assumed to be PCB waste containing greater than 500 mg/kg PCBs and disposed of along with the transformers and oil. When the transformers, oil and visually contaminated pads and soil are removed from the site and out of the way, a statistical sampling approach per 40CFR Part 761 Subpart N and Subpart O will be utilized to characterize PCB concentrations, identify the extent of PCB impacted areas, and determine the final excavation dimensions. The Field Work is further described in Section 4. PCB impacted soils to be removed from the site will consist of clay and limestone. The field work for this project consists of the following definable features or work, which are addressed in this Work Plan:

- Mobilizing equipment and personnel, and setting up temporary field facilities.

- Removal and disposal of 3 PCB transformers and drummed oil.
- Remove, package and dispose of contaminated concrete pads and visually contaminated soil under transformers.
- Establishing sampling grid per 40CFR Part 761 Subpart N and Subpart O.
- Preparing the site for removal action including trimming vegetation for access, and identification of lay down and work areas.
- Install and maintain environmental and engineering controls.
- Establishing work zones at the site including exclusion zone, contamination reduction zone and support zones.
- Excavate, package and transport contaminated soil from the site and transport back to the site treated soil as fill material.
- Perform characterization and verification sampling following removal action per 40 CFR Part 761 Subpart N and Subpart O as applicable.
- Prepare site maps to include final excavations and locations of verification sampling.
- Characterize all wastes generated during removal action.
- Transporting and disposing of PCB contaminated soil to an off-island EPA permitted PCB disposal facility.
- Dispose of all non hazardous debris generated from projects activities at the site.
- Site Restoration to include filling excavations with sufficient clean (less than 1ppm PCBs) return soil to return the site to original grade.
- Demobilizing personnel and equipment.
- Prepare final After Action Report documenting the successful completion of the site cleanup.

1.5 Project Organization

1.5.1 Project Manager

The Unitek Project Manager, Mr. LeRoy Moore, will communicate directly with the Country Club of the Pacific Management and serve as the primary point of contact during the project. His responsibilities will include project scheduling, cost updating, providing overall project direction, and overseeing site safety. In addition, the Project Manager will be responsible for determining the extent and level of input required for technical issues that arise during the tenure of the project. The Project Manager's direct subordinate in the chain-of-command will be the Project Supervisor for site activities.

1.5.2 Field Manager/Site Safety Officer

The SSO for this project will be Mr. Brad Wolfe. Mr. Wolfe will implement and enforce the project safety program and procedures for this project and ensure the work is carried out in accordance with the work plan provisions and project specifications. The SSO will conduct the daily safety meetings and will interface as required with other site representatives. The SSO will perform duties such as confirming that personnel are fit for duty, coordinating medical care, establishing communications with emergency responders, conducting daily safety inspections, and inspecting health and safety equipment. The SSO has the authority to stop unsafe operations and to remove unqualified personnel from the work area.

In addition, the SSO will be responsible for ensuring the proper maintenance of safety equipment, providing site orientation safety training for all personnel actively involved in site work, and maintaining other site safety documentation. The SSO will take the following action(s) when appropriate:

- Order the immediate shutdown of site activities in the event of a medical emergency or unsafe practice.
- Ensure that protective clothing and equipment are properly stored, used, and maintained
- Ensure that environmental and personnel monitoring operations are ongoing and that they comply with the technical specifications and required procedures.
- Restrict visitors from areas of potential exposures to harmful substances

The SSO will be responsible for implementing and enforcing the project site safety program and procedures. The SSO will oversee any personnel monitoring and decide when action levels have been reached that require more stringent personnel protection. The SSO will establish and enforce the personal protective equipment (PPE) requirements for site activities. The SSO will maintain daily contact with the Project PM. In the event Mr. Wolfe becomes unavailable during

any portion of the project Site Supervisors will assume the duties of the SSO and fill in as needed.

1.5.3 Project Site Supervisors

The Site Supervisor, Mr. John Gomez will be the primary supervisor on site. The Project Supervisor/s will also be responsible for conducting all on-site operations according to the directions of the Project Manager, contract specifications, and applicable safety guidelines. The Site Supervisor will provide a safe work environment for employees and contractors. He will ensure that each employee understands the safety procedure involved with each task (including that personnel are properly trained and the proper PPE is used), and immediately correct unsafe conditions. The Site Supervisor is required to coordinate all health and safety issues with the designated SSO and will assume the duties and responsibilities of the SSO when that individual is not on site. The Site Supervisor will also watch for ill effects on any of the crew members, especially those symptoms potentially caused by heat stress or chemical exposure. The Site Supervisor will oversee the safety of any visitors who enter the site.

1.5.4 Equipment Operators

Equipment Operators will be responsible for the safety operation and daily inspections of the equipment. Equipment Operators will promptly notify the Project Supervisor of any equipment safety issues or malfunctions as they occur so immediate actions can be taken to correct any deficiency and maintenance service can be scheduled when due.

2.0 PRE CONSTRUCTION ACTIVITIES

The following items or activities will be satisfied or in place before the commencement of any scope of work.

2.1 Permits, Licenses and Notifications

Operations will be performed in compliance with all applicable or relevant and appropriate requirements, including Federal and local Regulations. The following submittals will be provided to Region 9 EPA and Guam EPA for review and approval prior to the start of cleanup operations:

- Site Work Plan (WP)
- Sampling and Analysis Plan (SAP) (Appendix A)

2.2 Pre-work Survey of the Site

Prior to the commencement of any site operations, the contractor's Project Manager, Site Safety Officer and Site Superintendents will conduct a pre-work survey of the site to evaluate existing site conditions. Additionally, this survey will be performed to identity any hazards that may be present, and that may affect the health and safety of project personnel during the removal action activities. This survey will include the following:

- Determine safe access and movement within work areas
- Assess vegetation and clearing/grubbing requirements
- Determine logical work site layout
- Determine haul road location and road improvements if required
- Safety considerations

3.0 MOBILIZATION AND SITE PREPARATION

Upon acceptance of the WP and SAP, the Contractor will mobilize personnel and equipment for site operations. An initial crew will mobilize to begin survey and layout of both the project site as well as the excavation areas. The mobilization field work will consist of the following activities:

- **Removal and disposal of transformers and oil**. The first step of the project will be to remove and dispose of the 3 transformers and drums of oil from the site in order to provide proper access to perform the cleanup at the 2 release locations and eliminate any potential future threats to the environment posed by these materials. Unitek will mobilize all-terrain telehandlers and disposal trucks to the site to load and remove the 3 subject PCB transformers and 29 drums containing PCB oil and PCB oily water. These items will be properly labeled, placarded, manifested and transported per Department of Transportation (DOT) regulations to the USEPA permitted US mainland Treatment Storage and Disposal Facility (TSDF). Further details about the disposal are provided in Section 5.0 Waste Management Plan.

- **Mark excavation and site perimeters**. The visual extents of oil impacted soil will be marked for excavation in at Transformer 2 and Transformer 3 locations where remedial actions are necessary. A perimeter fence will be constructed around the site consisting of orange perimeter fencing and warning signs to isolate the worksite from other site occupants. The excavation area will extend at least one foot beyond the obviously visually contaminated areas horizontally and vertically. Final excavations will be overlain by a 10 foot by 10-foot sampling characterization and verification sampling following removal action per 40 CFR Part 761 Subpart N and Subpart O as applicable. Grid node stakes will be maintained so that stakes remain after excavations are complete for future reference.

- **Clear and grub vegetation in the work area**. Only vegetation required to be cleared for successful completion of the project will be cleared. Grass and woody trees which must be removed will be cut and move out of the way.

- **Establish work zones and install erosion controls**. A four foot high orange construction fence will be placed around the entire excavation (exclusion) zone and the Support Zone to demarcate and control access to the site. Signs will be posted from all directions of approach which alert site occupants to the hazards in the work area and the requirements to enter and discourage entrance into areas of potential contamination. A silt fence will be used to control soil erosion in the event of rainfall events. Four Zones will be delineated as:

    1. Exclusion zone (EZ) (excavation area)
    2. Contamination reduction zone (CRZ) (decontamination area)
    3. Support zone (SZ) (equipment materials storage sanitation facilities)
    4. Break area

Daily safety meetings will be held each day, prior to the remediation activity for that day. Attendance at these meetings will be documented on the daily safety meeting form.

An Activity Hazard Analysis (AHA) has been prepared for each work activity. The AHA identifies the sequence of work, the specific hazards anticipated, and the control measures that will be used to minimize or eliminate each hazard. The hazard control information in the AHA will be presented at the daily safety meeting for each activity to be performed that day. The prepared AHAs for this project are presented in Attachment 3 of the Site Health and Safety Plan (SHSP) (Appendix B).

3.1 Safety Requirements Personnel Qualification

As part of this contract the Contractor has developed a SHSP specifically for this project. The Contractor personnel will be required to read, sign and verify that they understand the project SHSP. As described in the SHSP, the Contractor will take all necessary preventive measures to provide a safe work environment during the execution of the project scope. Risk to employees and visitors is minimized through compliance with and OSHA 29 CFR 1920 and 1926 requirements applicable to the site.

All personnel on this project will have met the following minimum qualifications prior to working at the site:

- OSHA HAZWOPER Training per 29CFR 1910 and 1926
- Level of training commensurate with the nature of employees duties
- Current medical examination indicating employee is fit
- Fit testing to wear personal protective equipment.
- At least two employees at the site will be certified in First Aid and CPR.

3.1.1 Community and Public Safety

The contractor will conduct operations in such a manner as to protect human health and the environment. The project site will be surrounded with visible barriers with the appropriate hazardous site warning signs in accordance with applicable requirements. The barriers will discourage the public from entering areas of potential contamination or which pose other hazards within the work areas.

3.2 Decontamination Area

The decontamination of equipment and personnel will be performed in a designated area adjacent to the excavation work area. Equipment used in handling of contaminated soil will be decontaminated in this area as it exits the EZ. Equipment and personnel will decontaminate with scrapers, brushes or brooms or similar dry methods prior to leaving the EZ over containments or drop cloths. Soil material generated from decontamination will be recovered and packaged for disposal along with excavated soil. Disposable PPE will be placed in receptacles positioned in this area. Dry decontamination is preferred because any decontamination water generated would need to be containerized and characterized for disposal.

3.3 Site Security

The contractor will maintain site security throughout the course of the project with maintenance of the site barriers and warning signs. Before performing any field work the EZ, CRZ and SZ will be established to control the spread of contamination and isolate the work from other site occupants.

Temporary fencing , and safety signs will be erected around the site perimeters. Only authorized and properly trained personnel will be permitted on-site. All persons entering the site will be notified of safety and security procedures and will be required to have the proper training and PPE.

4.0 FIELD ACTIVITIES

Generally, the focus during the establishment of the work zones will be to minimize the disturbance by removing only the vegetation required for successful completion of the project.

Heavy equipment for this project may include a tire mounted backhoe, all terrain forklift, flat-bed truck, front end loader, box truck.

4.1 Personal Protective Equipment and Personnel Decontamination.

The contactor will provide PPE as required in the SHSP to all employees as necessary to perform the project and inspect work safely.

Receptacles will be provided to place used PPE for personnel leaving the exclusion zone and washing facilities will be provided for washing the hands and face as required following work shifts. Used PPE for the project will be containerized, sampled and characterized via laboratory analysis for proper waste disposal.

Sanitary facilities are available at the site.

4.2 PCB Control Area

The PCB Control Area or exclusion zone (EZ), which will consist of the excavation areas, will be surrounded with a physical boundary consisting of orange construction fencing and silt fencing. Sufficient space will be provided to allow for equipment and personnel movement within the work area. Signs will be posted indicating only authorized, qualified personnel are allowed within the PCB control area. The anticipated site layout, location of release, and proposed sampling grid layout is illustrated in Figures 4 and 5.

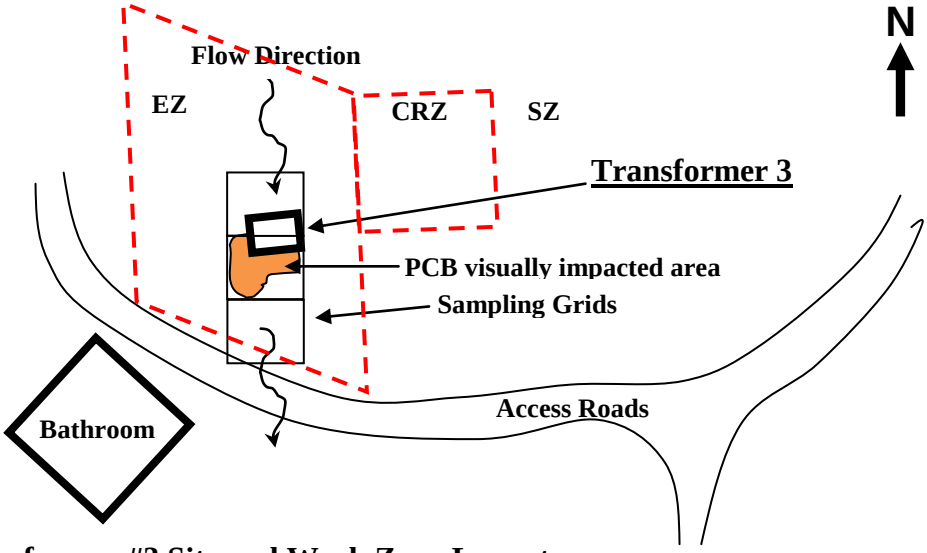

Figure 4. Transformer #3 Site and Work Zone Layout.

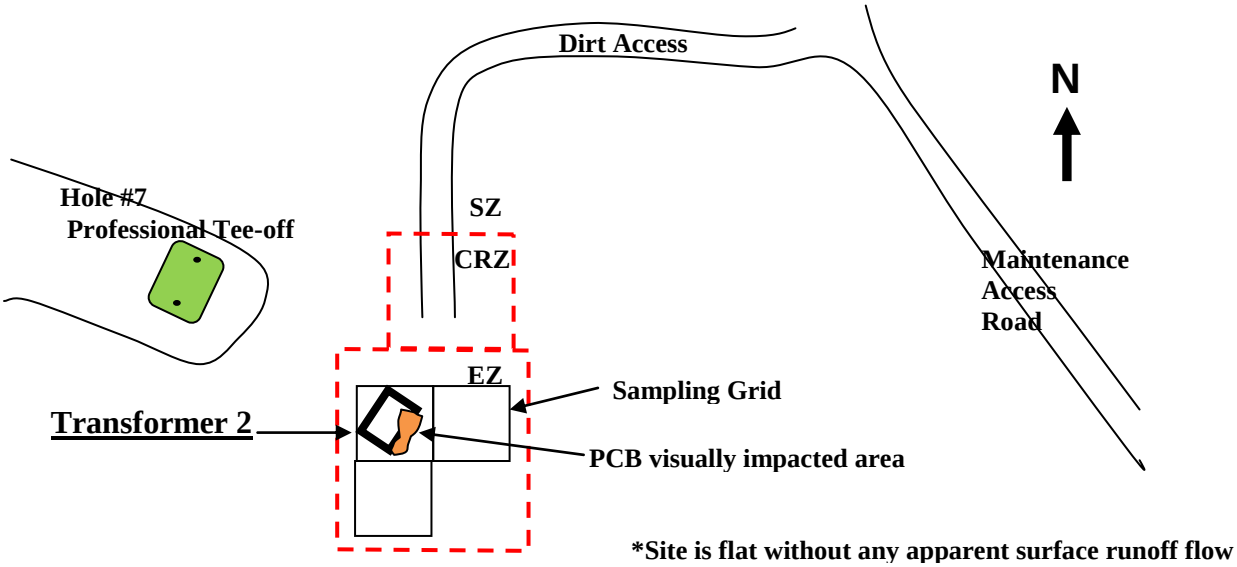

Figure 5. Transformer #2 Site and Work Zone Layout.

Dust suppression measures will be implemented to control dust as needed to prevent airborne dust concentrations below the site action levels. Dust suppression means may include slowing down equipment speeds, lowering drop heights, installing wind breaks and applying water spray as necessary.

The excavation of PCB contaminated soil will proceed from outside the excavation area as much as possible. This will reduce the amount of contaminated dirt being tracked by equipment tires as the equipment tires of the equipment will remain on the surface outside the open excavations throughout the project. The only time the equipment would have to go back through the excavation would be in the event confirmation sampling indicates contamination remains at the bottom of the excavation at which time only the backhoe would enter the excavations to continue excavation and the other equipment would remain outside the excavation perimeters. The forklift containing each soil bulk sack for loading will remain outside the active excavation perimeter during loading and likely will not require decontamination prior to removal of each cubic yard of soil through the CRZ. Should some decontamination of the forklift be required, dry methods of decontamination will be used if possible to minimize the amount of decontamination water generated.

4.3 Environmental Protection Plan

A spill kit will be maintained at the site which will contain sufficient absorbent materials to contain any possible PCB oil, oil or fuel spill from heavy equipment operation at the site. Although equipment brought to the site will be in very good working condition and well maintained, there is always a possibility of a hydraulic line rupture and or fuel spill so contingency measures must be in place.

No burning, open flames or high temperature sources will be allowed in the work area as toxic products of decomposition of PCBs may be produced.

It is anticipated that on site vegetation will provide ample natural wind break for protection from winds capable of moving fugitive dust off site. If this is not the case, dust suppression measures as mentioned earlier will be implemented.

The soils present at the site are very well drained and therefore erosion of soil at the site is not anticipated to become a problem. Silt fencing will be used as a precaution to prevent flooding of excavations or erosion of soil from excavations as appropriate.

Decontamination facilities will be provided for personnel and equipment leaving the EZ which have contacted PBC contaminated materials. The decontamination shall be thorough to remove all soil from the equipment or item being decontaminated. The Contractor will use dry decontamination methods to the extent practical during the project. Wet decontamination, if needed, will be performed by washing onto impermeable liners with a low drain point upon removal of equipment from the site. All decontamination soils and liquids will be properly contained, characterized and disposed.

4.4 Excavation

Prior to excavation, vegetation will be removed as required to facilitate the work. The contractor will excavate and remove and package soil from transformer 2 and transformer 3 sites to depth of 1-foot beyond the vertical and horizontal extents of visual contamination. Up to 10-cubic yards of PCB contaminated material is estimated for removal to complete this task. PCB contaminated concrete and soil will be loaded into 1 cubic yard DOT approved bulk sacks for shipment to a US EPA permitted facility.

The excavations up to four feet in depth will be excavated of the required width and length with the maximum allowable side slope based on the angle of repose of the excavated materials. Excavation operations will comply with the applicable sections of OSHA regulations. If required, excavations over four feet in depth will be sloped, stepped or will have shoring installed as appropriate. Surface water runoff will be diverted if necessary to prevent entry into the excavations by the use of silt fencing, swales, berms, and sloping as appropriate. No stockpiling of soils outside the excavation areas will be allowed. Excavated PCB soils will be placed directly into bulk sacs with liners. If staged inside the support zone loaded bulk sacs will be kept covered with visquene as an additional protective measure. As each bulk sack is filled, each will be properly labeled in accordance with 40 CFR 761 Subpart C.

4.5 Decontamination

Equipment which comes in contact with PCB-affected soil will require decontamination in accordance with 40 CFR 761.79(b)(B). In this case, items likely needing decontamination to this standard will be the backhoe bucket, shovels, and worker boots which come in contact with PCB contaminated soil. Decontamination shall continue until all soil is removed from the equipment and all areas will be visually inspected. The Contractor will maximize dry decontamination methods with scrapers/brushes rather than wet decontamination to the extent practical.

Dry Decontamination

Dry decontamination will be performed on equipment and personnel work boots for personnel who must enter the excavation areas throughout the project. It is anticipated that dry decontamination will be most effective during dry conditions and therefore work will be scheduled during dry weather conditions.

Workers or equipment will stand or be placed inside a plastic basin or plastic drop cloth in the CRZ and brush soil from work boots or equipment until soil residues have been removed. Contaminated PPE shall be removed in the CRZ. Items for reuse which are not decontaminated may be stored in the CRZ on a drop cloth and kept covered when not in use. Disposable PPE will be placed into receptacles in the CRZ and later characterized for proper disposal. All soil materials collected during dry decontamination will be placed into the Bulk sacks of soil for off island disposal.

Wet Decontamination

If conditions arise which require wet decontamination, workers performing decontamination will use tyvek coveralls and face shield in addition to the level D safety uniform in accordance with the SHSP. A 10-mil drop cloth of sufficient size to contain mists, splatter seepage, runoff and soil from the decontamination operation will be contained in the CRZ. The drop cloth edges will be held up so Decontamination water will collect at low points inside the drop cloth. High pressure wash with fresh water will be used to remove all soil from the equipment onto the drop cloth. All decontamination water, silt and soil would be removed from the drop cloth and placed into DOT approved 55-gallon steel drums on site for storage until proper sampling, characterization and disposal of the water is determined.

4.6 Characterization and Verification Sampling

After completion of the excavation to the prescribed width and depths as called out in Figure 3, characterization and verification sampling will be performed of the excavation sidewalls and floor in accordance with the SAP in Appendix C to confirm all material containing greater than 25 ppm PCBs has been removed. If verification sampling indicates that any material within the project limits contains greater than 25 ppm PCBs, the Contractor will notify the CCP of the estimated volume and location. At that time CCP will make the decision to remove additional material; or to leave concentrations > 25 but less than 50 ppm on site with the area secured with a fence and signage per 40CFR part 761.61(a)(4)(B)(2), or to leave greater than 50 ppm but less than 100 ppm PCBs on site secured with a cap per 40CFR Part 761.61(a)(7) and (a)(8). Upon approval of CCP to remove additional material these areas would then be excavated in additional 1-foot depth increments(excavation floor samples) or extended an additional 2.5 feet (excavation sidewall samples) until the verifications indicate 25 ppm PCBs or less. Soils containing less than 25 ppm PCBs will remain on site.

4.7 Post Excavation Site Survey

Upon meeting the cleanup goal at all portions of the excavation, the final excavation boundaries and verification sample locations will be recorded and provided on site maps for the Remediation Verification Report (RVR).

4.8 Site Restoration

Upon meeting the cleanup goal at all portions of the excavation, the excavation areas will be returned to the original grade. Clean soil will be borrowed from on-site sources free of PCB contamination to fill voids created by the excavation.

The disturbed area will then be re-vegetated naturally or CCP grounds maintenance will replant desired grass.

5.0 WASTE MANAGEMENT PLAN

The following section explains the handling and disposal of anticipated wastes expected to be generated during the project. Wastes will be characterized as hazardous or non-hazardous through laboratory analysis as described in the SAP for this project. The following Table 5-1 identifies anticipated wastes for this project and anticipated disposal.

Table 5-1 Anticipated Project Wastes

Material	Disposal
PCB soil >25 ppm	TSCA Hazard Off-island disposal
PCB contaminated debris >50ppm	TSCA Hazard Off-island disposal
PCB transformer oil	TSCA Hazard Off-island disposal
Construction debris	Non-hazardous local disposal
Green waste	Non-hazardous composting on-site
PPE	Non-hazardous local disposal - TBD
Decontamination water	Non-hazardous local disposal - TBD

TBD – To Be Determined

5.1 Waste Containers

All hazardous waste or potential hazardous wastes generated during the project will be stored in new containers that comply with 49 CFR 171-179, 40 CFR 761.60 and 40 CFR761.65. It is anticipated that two types of containers will be used at the site. Solid PCB soil materials will be packaged into 1 cubic yard bulk sacks. The UN Code number for the sacks which will be used is UN 13H3/Y/0711/CHN/5400/1000. All other wastes generated will be stored in 55 gallon steel open head drums rated for solids or liquids with a UN code of UN1A2/Y1.2/100&x400/S/07.

5.2 Waste Handling and Transportation of Wastes

Different types of wastes will not be mixed or diluted and will be separated and transported according to waste type. Containers will be kept closed at all times unless being actively filled. Containers will be adequately secured during transportation to prevent shifting of loads in all directions. Care will be taken not to spill soil or other wise spread wastes outside the EZ. Loose soil materials will be removed from the outsides of bulk sacks prior to removal from the EZ.

All Wastes generated will be transported from the site down designated access roads at CCP. The wastes will then be transported over public roadways to Unitek Environmental Guam in Sumay, Agat, Guam for loading into intermodal sea vans for off-island disposal as appropriate. Figure 6 indicates the anticipated haul routes for disposal of all wastes generated.

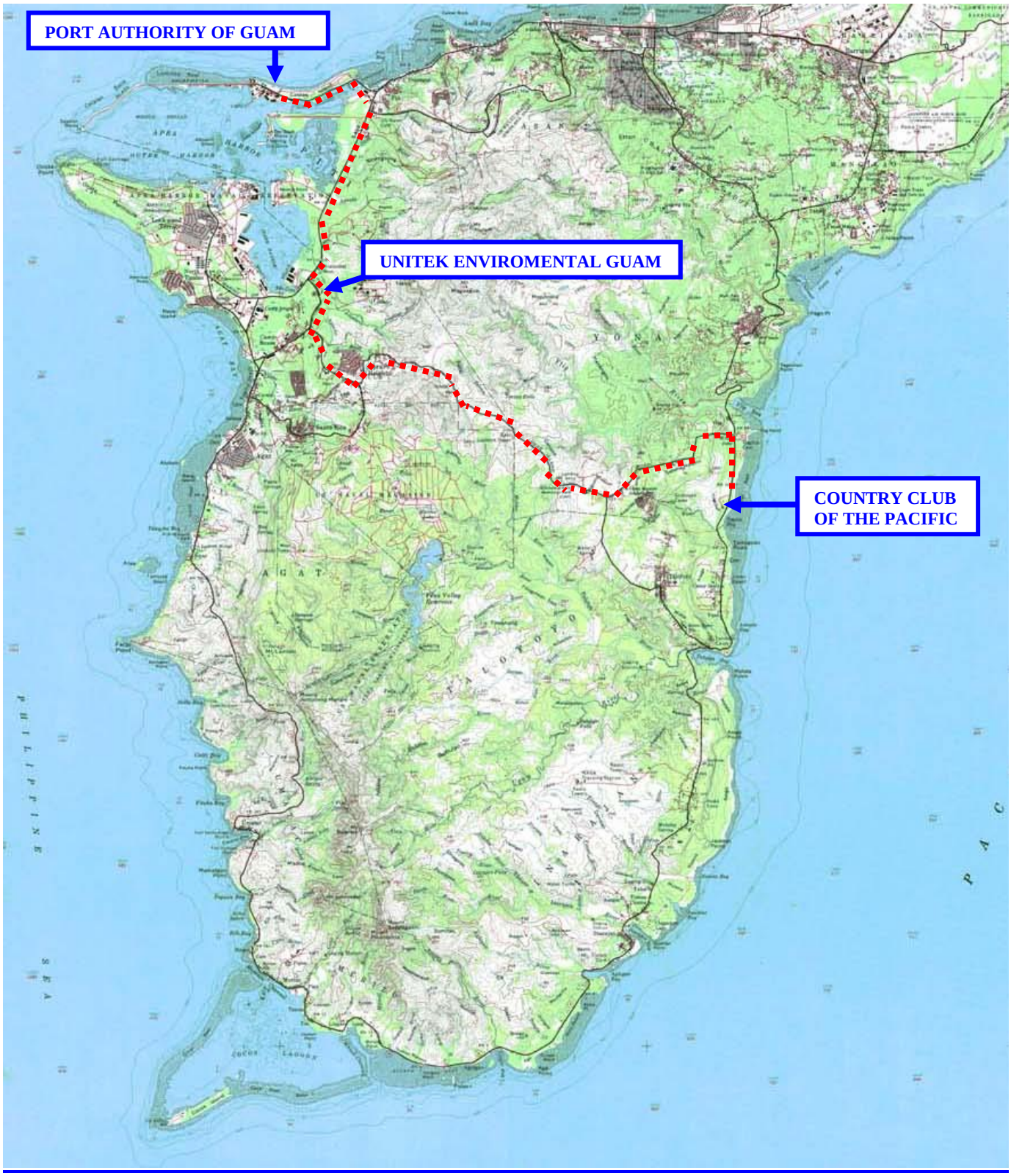

Figure 6. Haul routes for disposal of all PCB waste from CCP

5.3 Documentation of Wastes

All documentation and packaging shall be in full compliance with applicable rules and regulations including EPA requirements (40 CFR 761) and DOT Hazardous Material Regulations (49 CFR172-180).

The following documentation will accompany each shipping container of regulated waste as appropriate: EPA approved Uniform Hazardous Waste Manifests completed with required information for verifying the material type and quantity of each load in units of volume and weight, properly filled out labels, marks, placards, and material code numbers. The Contractor will also ensure that all loads are containerized appropriately according to applicable laws and regulations.

The submit waste manifests to CCP prior to shipment. Following review, the CCP will sign the waste manifest as the generator. Copies of each manifest will be retained by the CCP and the Contractor. After receipt of the shipment at the disposal/ treatment facility, the original copy will be provided to CCP with the disposal certificate. Additional copies of each manifest will be provided as follows:

1. Transporter: one copy
2. Disposal facility: three copies
3. CCP: two copies

5.4 Approved Waste Transporters

The following US EPA registered Hazardous Waste Transporters will transport the waste:

Unitek Environmental Guam EPA ID # GUD982430944

Matson Navigation Company EPA ID # CAD006912620

5.5 Off-Site Disposal Facility

Excavated PCB soils, oil and transformers from the site will be transported to the following facility for treatment/disposal:

U.S. Ecology
Hwy 95, 11 miles south of Beatty
Beatty, NV 89003
EPA ID# NVT330010000

6.0 REFERENCES

The following were utilized during generation of this Work Plan:

Guam Environmental Protection Agency (GEPA). 1982. Camp, Dresser & McKee, Inc. Northern Guam Lens Study (NGLS).

United States Department of Interior Geological Survey. 2000. Topographic Map. Guam, Mariana Islands. 1:50,000 Series.

United States Department of Interior Geological Survey. 2000. Topographic Map. Talafofo Quadrangle, Mariana Islands-Island of Guam. 1:24,000 Series.

United States Department of Tranportation (DOT), Title 40 Code of Federal Regulations, Part 172-180

United States Environmental Protection Agency (U.S. EPA), Title 40 Code of Federal Regulations, Part 261 and Part 262

United States Environmental Protection Agency (U.S. EPA), Title 40 Code of Federal Regulations, Part 761

United States Environmental Protection Agency (U.S. EPA) Data Quality Objects for Remedial Response Activities, Development Process. Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, Washington, D.C.

United States Environmental Protection Agency (U.S. EPA) Test Methods of Evaluating Solid Waste; Physical/Chemical Methods. SW-846. Fourth Edition, Office of Solid Waste and Emergency Response, Washington, D.C.

U.S. Geological Survey. Tracey, et al., 1964. Geology of Guam, Geological Survey Professional Paper 403-H, Plate 1.

Young, F.J. 1988. Soil Survey of Territory of Guam. United States Department of Agriculture, Soil Conservation Service.

Appendix

Appendix A

Sampling and Analysis Plan

Sampling and Analysis Plan
PCB Transformer Removal and Cleanup
Country Club of the Pacific
Yona, Guam

February, 2014

Prepared for:

Country Club of the Pacific
215 CCP Lane
Yona, Guam 96915

Prepared by:

Unitek Environmental Guam
P.O. Box 24607
Barrigada, Guam 96921

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List of Acronyms

%D	percent Difference
AIHI	Accredited Industrial Hygiene Laboratory
bgs	Below Ground Surface
BS	Blank Spike
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COC	Chain of Custody
DOT	Department of Transporatation
EPA	Environmental Protection Agency
ELISA	Enzyme-linked Immunosorbent Assay
GC/ECD	Gas Chromatograph/Electron Capture Detector
GC/MS	Gas Chromatograph/Mass Spectrometry
GPS	Global Positioning System
HRGC/MS	High Resolution Gas Chromatograph/ Mass Spectrometry
ID	Identification
IDW	Investigation-Derived Waste
LCS	Laboratory Control Sample
LD	Laboratory Duplicate
LORAN	Long Range Navigation Station
LQAP	Laboratory Quality Assurance Plan
MB	Method Blank
mg/kg	milligrams per kilogram
ug/L	micrograms per liter
mL	milliliter
uL	microliter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
PCB	Polychlorinated Biphenyl
ppm	parts per million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SI	Site Investigation
SOP	Standard Operating Procedure
SOW	Scope of Work
SQL	Sample Quantitation Limit
TSCA	Toxic Substances Control Act
Unitek	Unitek Environmental - Guam
USCG	United States Coast Guard
EPA	United States Environmental Protection Agency
WP	Work Plan

Section 1 Introduction

1.1 Project Identification

Project Name:	PCB Transformer Removal and Cleanup, Country Club of the Pacific, Yona, Guam
Site Address:	Country Club of the Pacific 215 CCP Lane Yona, Guam 96915
Unitek Project Number:	1354

This Sampling and Analysis Plan (SAP) describes the work procedures and methods that will be implemented and adhered to during characterization and verification soil sampling conducted during, and following, removal of polychlorinated biphenyls (PCBs)-containing soil from 2 transformer oil release sites at the Country club of the Pacific (CCP) golf course in Yona Guam. Unitek will perform the following primary tasks:

- Collection and analysis of soil characterization samples from excavated soil;
- Collection and analysis of soil verification samples from excavations following removal of soil; and
- Locate and record verification sample locations.

This SAP and Quality Assurance Project Plan (QAPP) were developed in accordance with industry standards and United States Environmental Protection Agency (EPA) guidelines for sampling and analysis. All work will be conducted in accordance with the project-specific Site Safety and Health Plan in Appendix B and the Work Plan (WP). General site information is included in the Project Work Plan.

1.1.1 Identified Contaminant Sources

Three (3) abandoned transformers of Japanese manufacture by Kitashiba Electric Co. LTD of Japan in 1972 were located at CCP. Laboratory testing of the oil from the transformers at the site Indicated they contained PCBs of 1450 ppm (Transformer 1), 2550 ppm (Transformer 2) and 1570 ppm (Transformer 3). Laboratory analysis of the oil indicated PCBs of Japanese origin resembling laboratory standards for PCB oil products known as Kanechlor-300 and/or Kanechlor-400. During the initial response to secure the transformers and prepare them for proper disposal, Transformers 2 and 3 were observed to have oil stains on the associated concrete pads and adjacent soil.

1.2 Project Scope and Objectives

The objectives of this project are to properly remove and dispose of the three PCB transformers, dispose of PCB containing oil/water/soil, and restore the site so that surface and subsurface PCB concentrations in soil are

below the Toxic Substance Control Act (TSCA) Low Occupancy Area, Title 40 Code of Federal Regulations (CFR) 761.61 cleanup criteria of 25 mg/kg (50 or 100 mg/kg with site controls). Successful completion of this project will eliminate the potential PCB source from the site, prevent further migration of contaminants at the site and will mitigate potential risk to site users and ecological receptors from exposure to PCBs. This SAP presents the procedures for characterizing PCB-containing soil excavated from the site and to verify the removal of soil containing concentrations of PCBs exceeding the TSCA cleanup levels.

Location of Soil Containing PCB Concentrations Exceeding the project cleanup Levels and the final excavation footprint will be determined based on the results of laboratory analysis of characterization/verification samples following removal of the transformers, oil, visually contaminated concrete pads and visually contaminated soils from the site during the initial disposal activities.

1.2.1 Identification of Data Needs

Data generated during this effort will include analysis of samples of excavated soils as well as soil samples collected from excavation bottoms and sidewalls.

The project contaminant of concern (COC) is PCBs:

Table 1-1: Contaminants of Concern

Matrix	Surface and Subsurface Soil
COC	PCBs

1.2.2 Sampling Objectives and Approach

Based on observations, the following specific objectives will be addressed during this characterization and verification sampling:

- **Assessment of the concentrations of PCBs contamination in excavated soil.** The initial 10 cubic yards of visually stained PCB-containing soil and concrete pads to be excavated in the vicinity of Transformers 2 and 3 will be assumed to contain greater than 500 ppm PCBs and will be disposed of along with the transformers and oil. Any additional soil requiring excavation to meet project cleanup goals will be sampled and tested for PCBs in order to characterize and determine proper disposal. All excavated soils exceeding applicable cleanup goals will be shipped to the off-island EPA permitted disposal facility.

- **Assessment of the presence of PCBs contamination in soils remaining at the site.** Verification soil samples will be collected from the bottom and sidewalls of the completed excavations in order to ensure that soil containing concentrations of PCBs greater than applicable cleanup goals have been removed. Verification soil samples will also be collected from surface soils within adjacent sampling grids out side the excavation extents to fully characterize the site and ensure the full extent of PCB impacted soil has been addressed.

1.2.3 Regulatory Standards

Results of soil sampling will be compared to the TSCA) Low Occupancy Area, Title 40 Code of Federal Regulations (CFR) 761.61 cleanup criteria of 25 mg/kg (50 or 100 mg/kg with site controls) as applicable.

Section 2 Project Organization

This section provides a summary of key project personnel, and the project organizational structure. Having a clear understanding of each individual and organization's roles and responsibilities will be instrumental in the successful completion of the soil characterization and verification sampling and analysis at CCP.

2.1 Project Organization and Responsibilities

The key personnel and organizations for this project are as follows:

USEPA Region 9– Ms. Carmen Santos, PCB Coordinator

Guam EPA- Mr. Don Quinata, Environmental Health Specialist

CCP, Mr. Hajime Ogimi, Operations Manager

Unitek Owner/President (Project Prime Contractor) – Mr. LeRoy Moore

Analytical Laboratory – ESN Pacific, Inc. Ms. Karen Carvallo

This organizational structure is designed to ensure that everyone involved with the project will receive proper instruction and information, and that appropriate quality assurance and quality control procedures will be followed throughout the field investigation. The roles and responsibilities of key project personnel are presented below.

2.1.1 Unitek Project Manager

The Unitek Project Manager, LeRoy Moore, has overall responsibility for completing the project in accordance with the approved WP. He will be in direct contact directly responsible for scheduling and developing the technical approach for completing project tasks, and providing strategic direction to project personnel. The Project Manager will be responsible for monitoring the quality of work products, ensuring that project milestones are being met, and for implementing corrective measures when necessary. Unitek Project Manager will be the primary point of contact available to regulators and CCP management. As such, he will be responsible for coordination with Unitek regarding deliverables, technical approach, contractual matters, schedules, meetings, and permits, if applicable, to satisfy the requirements of the WP. The Project Manager will also be available at any time during the course of this project to answer any questions that regulators or CCP might have.

Mr. Wolfe is tasked with the execution and direction of field activities and will implement the WP and this SAP and will also be in charge of coordinating with vendors to ensure that all necessary equipment, personnel, and supplies are ready and available to complete the tasks in the WP.

As Site Manager, Mr. Wolfe, will be responsible for overall completion of technical tasks included in this SAP. The responsibility of the site Manger includes ensuring that the technical approach, methods, and techniques are appropriate to enable attainment of the project objectives.

Additional responsibilities include for oversight technical activities to ensure that the quality of work is completed in accordance with industry, OSHA, and EPA standards or regulations. In addition, Mr. Wolfe will be responsible for coordinating with the analytical laboratory to ensure proper quality assurance and quality control (QA/QC) requirements are met for validation of the data generated.

2.1.2 Project Staff

Each member of the project staff will be responsible for understanding the requirements of this SAP prior to taking part in any field sampling activities. The project staff will receive their work assignment and instructions from the Site Manager. Members of the project staff are also responsible for understanding and implementing the QA/QC procedures in accordance with the QAPP applicable to the task being performed.

2.1.3 Analytical Laboratory

ESN Pacific, Inc. (ESN) of Honolulu, Hawaii has been contracted to provide project analytical services. ESN is currently an WA Department of Ecology certified laboratory and is certified to perform all of the analytical methods for this project. The laboratory will provide all necessary sample containers and will coordinate with the Site Manager regarding sample container shipment, sample delivery, and data delivery requirements and schedule. ESN will be responsible for producing data that meets the requirements and detection limits set forth in the QAPP and in the media and format required by the project SOW. Ms. Karen Corvallo will serve as the Laboratory Project Manager and the point of contact for this project.

2.1.4 Personnel Qualifications

All personnel assigned to the project, including employees and subcontractors, will be qualified to perform the tasks to which they are assigned. Appraisal of personnel qualifications will be made by the Unitek Site Manager. The appraisal will include a comparison of the job assignment requirements with the relevant experience and training of the prospective assignee. It will also include a determination of whether further project staff training is required. If further training is required, the necessary training will be completed before the start of field activities.

2.2 Project Schedule

Field work is tentatively scheduled to start towards the end of February, 2014, following the submittal and approval of project plans. The Remediation Verification Report will be completed following completion of field activities, receipt of analytical data and assessment of data.

Section 3 Sampling and Analysis Plan

This SAP presents the technical approach and specific procedures that will be used to conduct the characterization and verification sampling. The technical approach for the work procedures are designed to ensure that project tasks are conducted efficiently and safely, and that the environmental data collected meets the objectives of the project. The scope of the planned soil sampling and analysis focuses on gathering analytical and physical data to ensure that soil containing concentrations of PCBs greater than the TSCA cleanup levels established for the site are sussesfully removed from the site properly disposed.

The procedures in the following sections have been developed to provide sufficiently detailed instructions to permit project activities to be performed consistently and with high quality, independent of the individual performing the activity. All procedures will be conducted in accordance with standard industry methodologies.

3.1 Planned Activities

This SAP describes the procedures that will be used by Unitek personnel to complete the sampling and analysis portion of the project.

3.2 General Sampling Methods

Industry standard sampling protocol will be adhered to during the collection of all environmental samples. Disposable sampling equipment will be used in order to avoid risk of cross contamination and minimize generation of investigation derived waste (IDW) in the form of decontamination water. The sampler will don a pair of new, disposable, nitrile gloves for the collection of each environmental sample. At the time of collection, samples will be placed directly into EPA Protocol A sample containers. All pertinent information, including sample location, identification, QA/QC duplicate information, and site description will be logged in a project-specific field notebook.

This project will require analysis for PCBs of all soil characterization and verification samples using a EPA-approved methods. The total number of samples collected will be determined by the quantity required to successfully remediate the site to applicable TSCA cleanup standards. Characterization samples will be collected from bulk sack of soil excavated, (after the initial removal of 10 cubic yards of assumed > 500 mg/kg PCB of visually contaminated concrete pads and soil). In addition, one composite characterization confirmation soil sample will be collected from each sampling grid surface, bottom and sidewall per 40 CFR Part 761 Subpart N and Subpart O.

3.2.1 Excavated Soil Characterization Sample Collection

Should additional excavation be required beyond the initial 10 cubic yards, soil samples will be collected from excavated PCB-containing soil. A minimum of three samples or 10 percent will be collected from bulk sacks of soil to characterize the waste per 40 CFR Part 761 Subpart N.

Soil samples will be collected by using disposable trowels to scoop soil from the Super Sack. When possible, soil will be collected during the filling of each sack in order to collect soil from various layers within the sack. In order to ensure representative soil is collected from each sack, 3-5 scoops of soil will be collected from each sack from various locations within the soil contained in each sack (i.e., soil may be

collected from the bottom, middle and top of each sack of soil). Soil will be composited in the field and transferred into each laboratory sample container.

Upon collection into laboratory-provided containers, samples will be labeled, bagged in individual sealable plastic bags, and placed in insulated coolers packed with ice for preservation. Samples will be shipped to the analytical laboratory will be stored in coolers with ice for the duration of transport to the analytical laboratory via express courier. The required sample container type, volume, preservative and recommended holding times for soil samples are summarized in Table 3-1:

Table 3-1: Analytical Methods, Recommended Sample Containers, Preservatives, and Holding Times for Soil Samples

Parameter/Method	Number/Type of Containers per Sample*	Preservative	Holding Time	
			Extraction	Analysis
PCB Aroclors (EPA 8082)	8-oz soil jar with teflon-lined lid	Cool, 4°C	14 days	40 days

Laboratory analysis will be completed on a standard turn-around time of 10 working days for the soil characterization samples.

3.2.1.1 Soil Sample Identification

In order to enable easy comparison and assessment of results, soil characterization samples will have the following identification:

CCPSCzzz

where, CCP represents Country Club of the Pacific;

S represents Soil Sample

C represents Characterization Sample

zzz designates the chronological number (001).

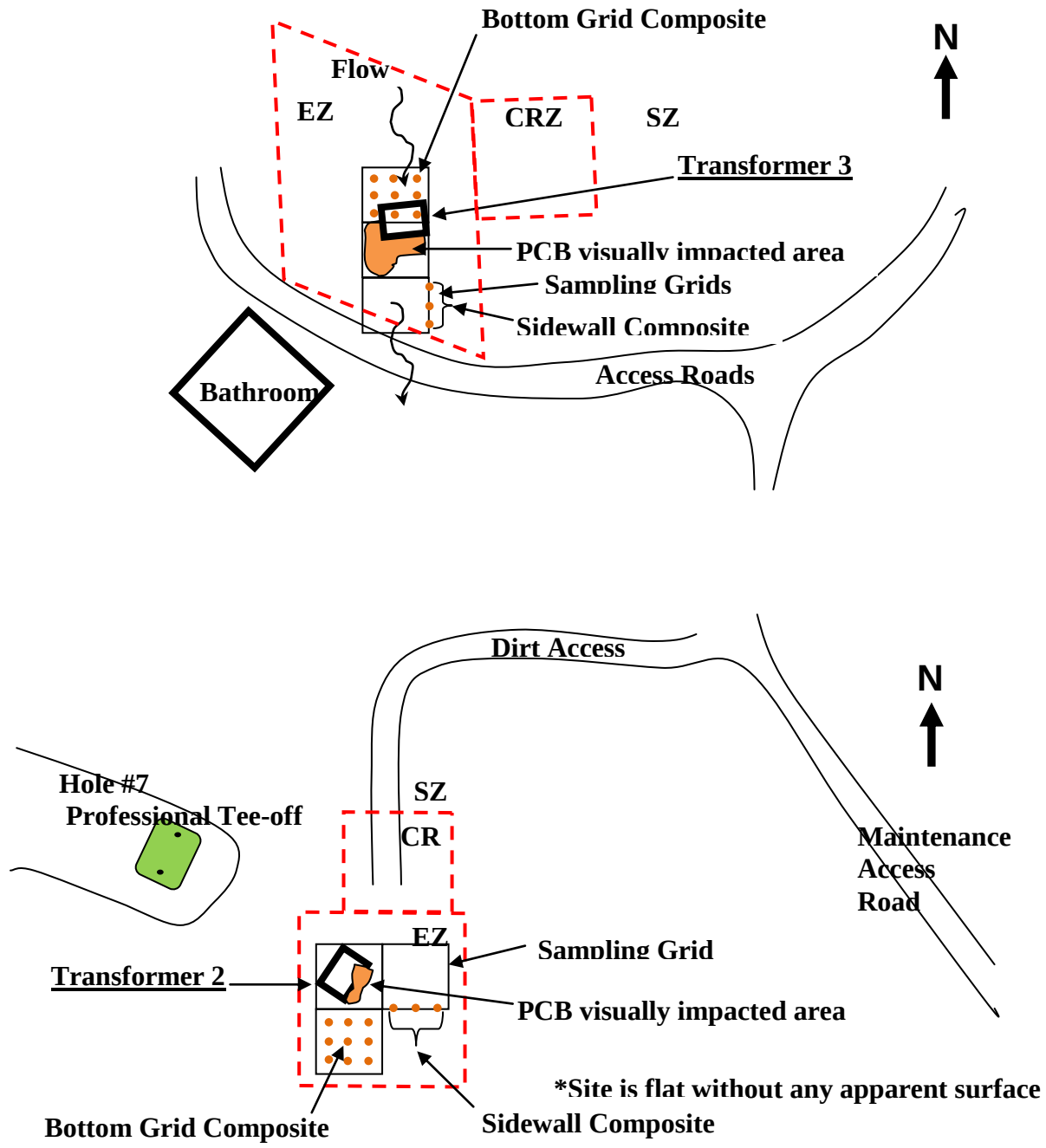
Sample numbering will begin from 001 and continue chronologically. Sample locations (the Bulk Sack from which each is collected), conditions, etc. will be documented in the field book. Blind duplicate samples will use the same numerical sequence, with corresponding primary samples and locations documented in the field book. The sample Identification of each sample will be marked on the corresponding Bulk Sack from which the sample is collected in order to aid in determining proper disposal upon receipt of results.

3.2.2 Verification Soil Sample Collection

Field personnel will collect verification soil samples from the bottom of the completed excavation in accordance with 40 Code of Federal Regulations (CFR) 761 Subpart O (See Appendix B which includes relevant excerpts from Subpart O). A 1.5 meter sampling grid size will be used on both the excavation bottom and sidewalls. Soil samples will be composited as outlined in 40 CFR 761.289 Subpart O and sent to the laboratory analysis of total PCBs by EPA SW-846 method 8082. The composite sample quantities are based on compositing guidance provided in 40 CFR 761.289 Subpart O that allows up to 9

grid points and/or an area up to ten feet in length to be composited together into a single sample. Actual sample numbers may vary depending upon excavation size and shape at the time of sampling. Blind duplicates will be collected at a frequency of ten percent of the total number of primary samples and sent to the analytical laboratory for analysis for QA/QC purposes. Figure 3-1 depicts proposed grid layout and verification sample locations.

Figure 3-1



Upon collection, samples will be labeled, bagged in individual sealable plastic bags, and placed in insulated coolers packed with ice for preservation following industry standards. Samples will be stored in

coolers with ice for the duration of transport to the analytical laboratory via courier such as Federal Express or the equivalent. The soil verification samples will be analyzed on a five-day turn-around time.

The required sample container type, volume, preservative and recommended holding times for soil samples are the same as those for the characterization samples and are summarized in Table 3-1.

3.2.2.1 Verification Soil Sample Identification

In order to enable easy comparison and assessment of results, soil verification samples will have the following identification:

CCPSVzzz

where, CCP represents Country Club of the Pacific;

S represents Soil Sample;

V represents Verification sample;

zzz designates the chronological number (001).

Figure 3-1: Proposed Verification Sample Grid and Sample Locations

Sample numbering will begin from 001 and continue chronologically. Sample locations, depths, intervals, conditions, etc. will be documented in the field book. Blind duplicate samples will use the same numerical sequence, with corresponding primary samples and locations documented in the field book.

3.2.3 Investigation Derived Waste and Debris Disposal

Waste materials and PPE which come in contact and with contaminated soil will be stored in drums on-site, sampled per 40 CFR Part 761 Subpart N and disposed of following completion of the project and a waste determination. Disposal of items will depend upon the waste determination. Contaminated hazardous or non-hazardous waste will be disposed of by Unitek.

3.2.4 Chemical Analysis

3.2.4.1 Laboratory Analysis

Soil characterization and verification will be extracted via method 3550 and analyzed for PCBs using EPA Method 8082.

3.2.5 Quality Control

Analytical laboratory data deliverables and data validation will adhere to established industry standard criteria, which are described in the Quality Assurance Project Plan (QAPP) section of this SAP. The QAPP also contains information related to specific laboratory procedures, QC procedures, analytes for each analytical method, laboratory detection limits, and other laboratory requirements.

Field QC samples will consist of blind duplicate samples collected at a frequency of ten percent (one duplicate for every ten primary samples per matrix type per site). Duplicate samples will be analyzed for the same parameters as the primary samples.

Section 4
Quality Assurance Project Plan

4.1 Introduction

This section presents the QAPP for environmental sampling activities. The field activities will consist of the collection of soil from the CCP site. This QAPP is intended to be used in conjunction with the SAP in order to ensure that all activities included with this project are conducted in a manner consistent with industry standard methods and techniques in order to provide data representative of conditions present at the site. The QAPP includes discussions of the following:

- Method selection and target analyte lists
- Laboratory and field quality assurance measurements and acceptable criteria
- Field and laboratory documentation and data management
- Data validation requirements
- Data evaluation procedures
- Performance and system audits
- Preventative maintenance
- Corrective actions
- QA/QC reporting

The Site Manager will be responsible for ensuring that the appropriate project personnel have the most current version of this QAPP.

The usability of the data collected during this project will depend on its quality. A large number of factors during the sample collection and analysis process have the potential to impact the overall quality of the data generated during this remediation project. Adhering to proper sample collection techniques, observing and documenting Chain of Custody (COC) procedures and using certified laboratories and approved analytical methods will ensure that the quality of data generated by this effort will accurately represent conditions at the site.

4.2 Sample Collection and Sample Handling Procedures

Prior to sampling, the Site Manager will inspect all supplies and consumables to insure that they are acceptable for use. Sample containers and equipment will be used only if they have been certified pre-cleaned or if their packaging or seals have not been broken. Sampling and sample handling procedures are designed to ensure that samples are consistently collected, labeled, preserved, and transported in a manner that maintains their integrity for their intended purposes. Copies of this SAP and appropriate field procedures will be on-hand during field data collection.

4.2.1 Sample Collection Method

Samples will be collected in accordance with the procedures detailed in Section 3 (the SAP).

4.2.2 Sample Handling and Shipping

Glass containers will be wrapped in bubble-wrap or other appropriate protection to prevent breakage during shipment. An appropriate absorbent material will be placed on the bottom and top of the cooler to absorb any water, to cushion the contents, and to absorb any sample material that may leak or spill. United States Department of Transportation (DOT) regulations will be followed for packaging and shipment of samples.

All samples will be kept at approximately 4 ± 2 degrees C in insulated coolers packed with frozen gel packs or wet ice. Samples will be properly preserved and transported to the laboratory as soon as possible, via Federal Express or an equivalent. Due to the remote nature of the site, it may not be logistically possible to adhere to all hold times and temperature parameters. In the event that samples are analyzed after hold times are exceeded, data will include proper qualifier flags indicating the validity of the data.

COC forms will be placed inside sealable plastic storage bags and placed inside the sample cooler for shipment, while project copies will be maintained on-site. Coolers will then be closed, sealed with waterproof tape, and the lid sealed with two custody seals to enable detection of tampering. Coolers will be delivered directly to the shipping office by the E2 field crew.

4.2.3 Sample Logs, Labeling, and Chain-of-Custody

Bound, paginated, and waterproof field notebooks will be maintained by the field personnel to provide daily records of significant events, observations, and measurements during field investigations.

Each sample container sent to the laboratory must have its own sample identification label. The following information will be included on the sample label:

- Site name;
- Sample ID Number;
- Date and time of sample collection;
- Type of sample matrix;
- Initials of the sampling personnel;
- Sample preservative used; and
- Types of analyses to be performed.

COC documentation will be maintained for samples during all phases of sample collection, transport, and receipt and internal transfer within the laboratory.

4.2.4 Field Instrumentation

Field equipment that may be used during field activities for monitoring purposes may include:

- MiniRam aerosol meter; and
- Handheld GPS unit.

Preventive maintenance of field equipment will be performed in accordance with the requirements of the specified manufacturer. Equipment will be periodically cleaned, checked for operability, and repaired as necessary. Equipment will be properly stored when not in use.

Field equipment will be calibrated prior to and during use as specified by the manufacturer. All calibration activities will be noted in the field logbooks. Field sampling personnel are responsible for ensuring that the manufacturer's guidelines are on-site with the equipment and that the equipment is tested, calibrated, and found to be in good working condition prior to use. Field personnel will also ensure that the instruments are stored properly and protected against excess heat, dust, and moisture. Field equipment preventive maintenance frequencies will be determined based on the manufacturer's recommendations and the anticipated use of the equipment.

4.2.5 Equipment Decontamination

It is not anticipated that decontamination will be necessary on this project. If necessary, however, equipment will be decontaminated by a non-phosphate detergent scrub followed by fresh water rinse, and distilled or deionized water rinse and spray, if readily available.

4.2.6 Acceptance of Supplies and Consumables

All field consumables will be inspected by the field manager prior to use and discarded if the integrity has been altered and there is any possibility of the use of the consumable will sacrifice the integrity of the sampling effort.

4.3 Sampling Quality Control and Corrective Action

Field and laboratory QC samples will be collected and analyzed in accordance with industry standard methods and practices.

4.3.1 Field Quality Control

Quality assurance of samples collected in the field will be ensured through the use of trained sampling personnel, documented and standardized procedures, second-party review of field logs and notes, and collection of field QC and QA samples. The following sections discuss the procedures used to ensure the collection of representative samples.

Field QC sample collection will consist of field blind duplicates as listed in Table 4-1.

Table 4-1: Minimum Field Quality Control Samples

Type of Sample	Frequency
Blind Duplicates	Approximately 10% of primary samples

4.3.1.1 Blind Duplicates

Field duplicate samples will be collected at a frequency of approximately ten percent for each sample matrix from each site (i.e., 1 field duplicate will be collected for every ten primary samples of each matrix from each site). Field duplicate samples will be submitted to the laboratory as a blind duplicate, with a unique sample ID number. The duplicate results will be incorporated into the overall assessment of the precision of the sampling and analytical system.

4.4 Laboratory Analytical Procedures

The laboratory selected to perform the analyses (ESN) has a QA/QC program in place. All analyses will be conducted according to the guidance outlined in EPA SW-846 (EPA 1997)

4.5 Laboratory Analysis Quality Assurance Objectives

Laboratory control samples will be analyzed by the laboratory concurrently with the samples collected during this investigation.

Laboratory QC checks will include the following QC samples:

- Method blanks and reagent blanks
- Matrix Spike (MS) samples
- Matrix Spike Duplicate (MSD) samples
- Surrogates (applicable to organic analyses only)
- Blank spike (BS) or laboratory control samples (LCSs)

4.5.1 Method Blank

A Method (or preparation) Blank (MB) sample will consist of analyte-free deionized water or clean soil for analysis of aqueous or solid samples. The MB sample will be carried through each step of the analytical method. The MB data will be used to evaluate any laboratory contamination during analysis. MB samples will be analyzed and reported for each analytical batch.

4.5.2 Matrix Spike/Matrix Spike Duplicate

A MS sample is an aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A MS sample is used to document the bias of a method in a given sample matrix. MSD samples are internal laboratory split samples spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix.

A minimum of one MS/MSD analysis will be performed for approximately every 20 sample analyses, or every analytical batch. An extra aliquot of sample will be collected for MS/MDS analyses. Samples for MS/MSD analysis will be designated on the COC form by field sampling personnel. The laboratory is not required to use the designated samples for MS/MDS analyses if the samples are batched with other samples and sufficient volume of other samples is available to perform MS/MSD analyses at the required frequency.

4.5.3 Laboratory Duplicate (Surrogate)

A Laboratory Duplicate (LD) sample is an internal laboratory split sample that is prepared and analyzed in a manner identical to that of the original project sample. The results will be used to evaluate the precision of the laboratory analyses. Results will be expressed as relative percent difference (RPD) between analytical results for the duplicate and the original sample.

4.5.4 Laboratory Control Sample

A LCS is a well-characterized sample matrix spiked with compound(s) representative of the target analytes that documents laboratory performance. LCSs are used to monitor the accuracy of the analytical process independent of project sample matrix and to identify potential background interference or contamination of the analytical system. LCSs will be analyzed and reported for each analytical batch. Duplicate laboratory control sample is an internal laboratory split of a LCS. Accuracy (recovery) and batch precision are determined using LCS/duplicate LCS.

Controlling laboratory operations with LCSs (as opposed to MS/MSD samples) offers the advantage of being able to differentiate recoveries due to procedural or errors from those due to sample matrix effects.

Laboratory QC samples will be analyzed by each analytical method per sample delivery group (SDG). A SDG will be made up of no more than 20 samples. In particular, one method blank will be analyzed per method per matrix per SDG. Also, one MS will be conducted per SDG. For inorganic analyses, one duplicate sample analysis per batch will be performed; for organic analytes, one MSD will be performed. Blank spikes for organic analyses and laboratory control samples for inorganic analyses will be performed per SDG. Where applicable, samples for organic analyses will have surrogates added and analyzed.

4.5.5 Laboratory Equipment Calibration and Preventive Maintenance

Laboratory equipment will be maintained in accordance with the approved laboratory QA program and as specified by the analytical method employed for sample analyses.

The laboratory equipment will be calibrated following the procedures and frequency specified by the analytical methods used. The laboratories are required to document calibration procedures and preventive maintenance in accordance with industry standard guidance and their established QA/QC program. A control system indicating the date of required maintenance, the person maintaining the equipment, and the next maintenance date will be used by laboratory personnel for laboratory equipment requiring routine maintenance. Most of the major instruments found in laboratories are covered by service agreements. Information pertaining to historical maintenance will be recorded in individual logs for each instrument.

4.5.6 Data Turn-Around Times and Deliverables

The laboratory will provide reports that include a case summary and the QC reports. The laboratory will also provide data deliverables in a specified electronic format. All laboratory deliverables will be submitted within 35 days of receipt of samples at the laboratory.

Laboratory analysis will be completed on a 5-day turn-around time for the soil characterization and soil verification samples.

4.5.7 Intended Laboratory Standard Operating Procedures Deviations

No standard operating procedure (SOP) deviations are intended for the analytical methods specified in this plan. Use of the laboratory QC data will be consistent with the procedures for data evaluation. The laboratory QC data will assist in evaluating the usability of the data for the project objectives.

4.5.8 Reporting Limits Objectives

Table 4-2 presents the project laboratory's (ESN Pacific) detection limits for soil. The tables also include the regulatory limits required for this project. The detection limits listed may not be achievable in individual samples for any of the following reasons:

- When analytes are present in the sample at concentrations that exceed the calibration range, dilutions may be necessary, resulting in elevated reporting limits for all analytes. The laboratory will report both the diluted and undiluted sample results to allow acceptance of the lower detection limits for analytes not detected from the undiluted sample.
- If matrix problems occur, dilutions may be necessary and the listed detection limits may not be met for each sample for each analyte.

Compounds detected above the detection limit but below the reporting limit may be qualified as estimated with a "J" qualifier.

Table 4-2: ESN Labs Analytical Detection Limits and Regulatory Levels for Soil

Analyte	Lowest TSCA Cleanup Criteria	ESN MDL
PCBs by 8082B	**mg/kg**	**mg/kg**
Aroclor-1016	ns	0.025
Aroclor-1221	ns	0.15
Aroclor-1232	ns	0.1
Aroclor-1242	ns	0.04
Aroclor-1248	ns	0.02
Aroclor-1254	ns	0.04
Aroclor-1260	ns	0.025
Kanechlor (compared to Aroclor 1242 standard)	ns	0.04
Total PCBs	1.0	

Notes:
Control limits specified in this table are specified by ESN Pacific Labs. The laboratory-specific control limits shall be used by the laboratories performing analyses for corrective action and reporting, as well as for data validation.
MDL= method detection limit
ns = Not specified

4.6 Data Validation

4.6.1 Data Quality Assessment

Data quality will be assessed by evaluating the precision, accuracy, representativeness, completeness, and comparability parameters both qualitatively and quantitatively.

4.6.1.1 Precision

Precision is defined as the agreement between a set of replicate measurements without assumption or regard about the true value. Precision limits for laboratory measurements will be evaluated from the

sample/sample duplicate analyses results. Field sampling precision will be evaluated from field duplicate sample analyses results. The following criteria will be used to evaluate field duplicate samples:

- For analytes with the sample concentration greater than five times the reporting limit, the duplicate sample results should agree within 100 percent for soil samples and 50 percent for water samples.
- For analytes with either or both sample concentrations less than five times the reporting limit, duplicate soil sample concentrations should agree within ten times the reporting limit and water samples should agree within five times the reporting limit.

The RPD measured between two duplicate samples will serve as the quantitative measure of precision. Precision for sampling is evaluated separately from precision for analytical data. Field co-located duplicate samples help clarify the distinction between uncertainty due to analytical variability and heterogeneity of the sample matrix. These field duplicates are co-located samples that are collected either at a location immediately adjacent to the original samples, immediately above or below the original samples, or from the same locations and at the same time as the original samples.

Laboratory duplicate samples, MS/MSD or LCS/duplicate LCS analyses results will be used to assess analytical precision.

4.6.1.2 Accuracy

Accuracy is defined as the degree of agreement of a measurement to an accepted reference or true value. When applied to a set of observed values or measurements, accuracy will be a combination of random and systematic (bias) error. Analytical accuracy will be defined as the percent recovery (%R) of an analyte in a reference standard or spiked sample. Accuracy limits for LCS and MS/MSD samples are established by individual laboratories. The acceptance criteria for accuracy are dependent on the analytical method, and are based on historical laboratory data. Failure to meet the accuracy limits will be described in the SDG case narrative and summarized in the data review reports.

The percent differences (%Ds) of the continuing calibration is also an indication of accuracy. Sample results are qualified "UJ" for non-detects and "J" for detects, if the %D for a continuing calibration is out of control.

4.6.1.3 Representativeness

Representativeness is the degree that data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness will be achieved by conducting sampling in compliance with the sample collection procedures described in the Sampling and Analysis Plan (Section 3). Homogenized field duplicate samples will be collected and used as a means to assess field representativeness. The SAP sections details preliminary sample points; however, once on site, the number and types (matrix) of samples collected at each investigation site will be reassessed to insure that the site is adequately sampled. Sample locations will be biased towards areas where releases would likely migrate to and/or accumulate.

4.6.1.4 Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated values) compared to the total number of analytical results reported by the laboratory. The completeness goal for this project will be 90 percent. Successful completion of data acquisition can only be accomplished if both the field and laboratory portions of the project are performed according to the procedures described in the QAPP.

4.6.1.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data are considered comparable if collection techniques, measurement procedures, methods, and reporting are equivalent for the samples within a sample set. Comparability for sampling will be determined to be acceptable based on the following criteria:

- A consistent approach to sampling was applied throughout the program;
- Samples were consistently preserved; and
- Sampling was performed during the same time of year and under similar physical conditions.

4.7 Audits and Corrective Actions

System and performance audits are key elements that ensure that the QA process is being applied throughout the analysis and evaluation activities.

4.7.1 Field System Audits

Field performance audits are self-assessments. The audit may include a check of the number of samples collected versus those planned, ensuring that the correct analytical methods were requested, ensuring that the correct number of field QC samples is being collected, and that appropriate sample collection techniques are used. Field audits will not be conducted during this project.

4.7.2 Data Audits

Data audits will not be conducted during this project.

4.7.3 Corrective Actions

If problems with either laboratory or field procedures occur, or if problems of non-compliance are noted during the laboratory, field system, or performance audits, corrective actions will be implemented. Laboratories will document corrective action on corrective action forms.

The overall process consists of the following:

- Identifying potential errors or problems;
- Documenting these errors or problems;
- Correcting the errors or problems; and
- Documenting the corrective action.

Common errors or problems that can be anticipated and corrected are listed in Table 4-3. These are several problems that occur often enough to warrant discussion and resolutions are also listed for each item.

4.7.4 Reports to Management

The Site Manager may request that a specific laboratory QA report be prepared, based on results of audits and potential corrective actions. If required, the QA report will discuss the status of the project, including

the results of performance and system audits, the results of data quality assessments, QA problems, and methods to resolve these problems.

Table 4-3: Common Problems Encountered with Laboratory or Field Procedures and Their Resolutions

Issue	Resolution
No water preservative is available or the supply of preservatives runs out	Send unpreserved water samples to the laboratory and request that the laboratory preserve the samples appropriately. Document this on the COC form.
Glass sample containers are broken when they arrive at the laboratory	Instruct the laboratory to use water from another container, if enough volume is present and the same preservative was used; re-sample if the schedule and budget allow. Extra volume will be sampled in case of breakage.
Temperature in cooler upon arrival at the laboratory is too warm (>6^{o}C)	For future samples, use more ice; refrigerate sample before shipping; determine if courier has delayed shipments; re-sample if the schedule and budget allow.
Not enough sample volume (for the MS/MSD)	The QA Manager will contact the laboratory to discuss if a sample in that SDG has extra volume and can be used for the MS/MSD; notify the field sampling team to send additional volume for sample that will be used for the MS/MSD.
COC form not completed properly or thoroughly	The QA Manager will send revised COC form to laboratory, and contact field sampling team to make them aware of deficiencies.
No preservative used, or pH above or below criteria	Laboratory will add appropriate preservative, and notify field sampling team of deficiency.
SDG completed without an MS/MSD sample designated	The QA Manager coordinator will contact lab to determine if a sample has extra volume and can be used for the MS/MSD, otherwise, the lab will be instructed to ensure that an LCS/LCSD pair will be included in the extraction and analytical batch.

Notes:
COC = chain of custody
MS/MSD = matrix spike / matrix spike duplicate
SDG = sample delivery group
LCS/LCSD = laboratory control sample / laboratory control sample duplicate

Section 5 References

Code of Federal Regulations, Title 40, Subpart N, Cleanup Site Characterization Sampling for PCB Remediation Waste in Accordance with Part 761.61(a)(2).

Code of Federal Regulations, Title 40, part 761.283, Subpart O, Sampling to Verify Completion of Self-Implementing Cleanup and On-site Disposal of Bulk PCB Remediation Waste and Porous Surfaces in Accordance with Part 761.61(a)(6).

Department of Defense Environmental Data Quality Workgroup. *Department of Defense, Quality Systems Manual for Environmental Laboratories*. 2000. Version 1. October.

Environmental Protection Agency, United States (EPA). 1979. *Methods for Chemical Analysis of Water and Wastes*. EPA 600/4-79-020. Revised. March.

EPA. 1994. *Guidance for the Data Quality Objective Process.* EPA/600/R-96/055. Office of Research and Development. September.

EPA. 1995. *Contract Laboratory Program – Statement of Work for Inorganic Analysis – Multi-Media, Multi-Concentration.* Document ILM04.0.

EPA. 1996. *Test Methods for Evaluating Solid Waste, SW-846.* 3rd ed. Final Update III. Washington. GPO. November.

EPA. 1999. *Contract Laboratory Program – Statement of Work for Organic Analysis – Multi-Media, Multi-Concentration.* Document OLM03.2. May.

EPA. 2001. *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5.* EPA/240/B-01/003. Quality Assurance Division. March.

EPA Region 4. 2001. *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual.*

EPA Region 9. 2000. *Sampling and Analysis Plan Guidance and Template*.

Appendix A

Project Forms

- Chain of Custody

ESN Pacific 2020 Kahai St. Honolulu, HI 96819
Phone: (808) 847-0067
Fax: (808) 847-0917
E-mail: ESNPacific@aol.com

Chain of Custody & Sample Information Record

Client: Contact: Phone No.

Project Name: _____
Project Location:

Turn Around Time: Routine 3-5 Days 48 Hours 24 Hours *(Rushes Require Approval, Additional Charges May Apply)*

Sampler Information

Name: _____
Employer: _____
Signature: _____

ESB#	Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NH_4Cl	Total # of Containers	Sample Type: Routine	Resample	Special	Analysis Requested	Matrix	Notes
																DW = Drinking Water WW = Waste Water GW = Ground Water S = Soil SG = Sludge L = Liquid M = Miscellaneous	

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company

(For Lab Use Only) *Sample Integrity Upon Receipt*

Sample(s) Submitted on Ice? Yes No Temperature
Custody Seal(s) Intact? Yes No NA ºC
Sample(s) Intact? Yes No

Lab Notes

Lab No._____

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Appendix B

Excerpts from 40 CFR Subpart N and O

e-CFR Data is current as of February 12, 2014

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Title 40: Protection of Environment
PART 761—POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS

Subpart N—Cleanup Site Characterization Sampling for PCB Remediation Waste in Accordance with §761.61(a)(2)

Contents

SOURCE: 63 FR 35464, June 29, 1998, unless otherwise noted.

§761.260 Applicability.

This subpart provides a method for collecting new data for characterizing a PCB remediation waste cleanup site or for assessing the sufficiency of existing site characterization data, as required by §761.61(a)(2).

§761.265 Sampling bulk PCB remediation waste and porous surfaces.

(a) Use a grid interval of 3 meters and the procedures in §§761.283 and 761.286 to sample bulk PCB remediation waste that is not in a container and porous surfaces.

(b) Use the following procedures to sample bulk PCB remediation waste that is in a single container.

(1) Use a core sampler to collect a minimum of one core sample for the entire depth of the waste at the center of the container. Collect a minimum of 50 cm^3 of waste for analysis.

(2) If more than one core sample is taken, thoroughly mix all samples into a composite sample. Take a subsample of a minimum of 50 cm^3 from the mixed composite for analysis.

(c) Use the following procedures to sample bulk PCB remediation waste that is in more than one container.

(1) Segregate the containers by type (for example, a 55-gallon drum and a roll-off container are types of containers).

(2) For fewer than three containers of the same type, sample all containers.

(3) For more than three containers of the same type, list the containers and assign each container an unique sequential number. Use a random number generator or table to select a minimum of 10 percent of the containers from the list, or select three containers, whichever is the larger.

(4) Sample the selected container(s) according to paragraph (b) of this section.

§761.267 Sampling non-porous surfaces.

(a) Sample large, nearly flat, non-porous surfaces by dividing the surface into roughly square portions approximately 2 meters on each side. Follow the procedures in §761.302(a).

(b) It is not necessary to sample small or irregularly shaped surfaces.

§761.269 Sampling liquid PCB remediation waste.

(a) If the liquid is single phase, collect and analyze one sample. There are no required procedures for collecting a sample.

(b) If the liquid is multi-phasic, separate the phases, and collect and analyze a sample from each liquid phase. There are no required procedures for collecting a sample from each single phase liquid.

(c) If the liquid has a non-liquid phase which is >0.5 percent by total weight of the waste, separate the non-liquid phase from the liquid phase and sample it separately as a non-liquid in accordance with §761.265.

§761.272 Chemical extraction and analysis of samples.

Use either Method 3500B/3540C or Method 3500B/3550B from EPA's SW-846, Test Methods for Evaluating Solid Waste, or a method validated under subpart Q of this part, for chemical extraction of PCBs from individual and composite samples of PCB remediation waste. Use Method 8082 from SW-846, or a method validated under subpart Q of this part, to analyze these extracts for PCBs.

§761.274 Reporting PCB concentrations in samples.

(a) Report all sample concentrations for non-liquid PCBs on a dry weight basis as micrograms of PCBs per gram of sample (ppm by weight). Report surface sampling results as µg/100 cm^2. Divide 100 cm^2 by the surface area and multiply this quotient by the total number of micrograms of PCBs on the surface to obtain the equivalent measurement of micrograms per 100 cm^2.

(b) Report all sample concentrations for liquid PCBs on a wet weight basis as micrograms of PCBs per gram of sample (ppm by weight).

Title 40: Protection of Environment
PART 761—POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS

Subpart O—Sampling To Verify Completion of Self-Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste and Porous Surfaces in Accordance With §761.61(a)(6)

Contents

SOURCE: 63 FR 35465, June 29, 1998, unless otherwise noted.

§761.280 Application and scope.

Follow the procedures in this subpart when sampling to verify completion of the cleanup for self-implementing, on-site disposal of bulk PCB remediation waste and porous surfaces consistent with the levels of §761.61(a)(4)(i) and (iii). The objective of this subpart is not to search for new contamination. Confirmation of compliance with the cleanup levels in §761.61(a)(4) is only verifiable for the area sampled in accordance with this subpart. Do not make conclusions or extrapolations about PCB concentrations outside of the area which has been cleaned up and verified based on the results of this verification sampling.

§761.283 Determination of the number of samples to collect and sample collection locations.

This section addresses how to determine the number of samples to collect and sample collection locations for bulk PCB remediation waste and porous surfaces destined to remain at a cleanup site after cleanup.

(a) *Minimum number of samples.* (1) At each separate cleanup site at a PCB remediation waste location, take a minimum of three samples for each type of bulk PCB remediation waste or porous surface at the cleanup site, regardless of the amount of each type of waste that is present. There is no upper limit to the number of samples required or allowed.

(2) This is an example of how to calculate the minimum number of required samples at a PCB remediation waste location. There are three distinct cleanup sites at this example location: a loading dock, a transformer storage lot, and a disposal pit. The minimum number of samples to take appears in

parentheses after each type of waste for each cleanup site. The PCB remediation wastes present at the loading dock are concrete (three samples) and clay soil (three samples). The non-liquid PCB remediation wastes present at the transformer storage lot are oily soil (three samples), clay soil (three samples) and gravel (three samples). The PCB remediation wastes present at the disposal pit are sandy soil (three samples), clay soil (three samples), oily soil (three samples), industrial sludge (three samples), and gravel (three samples).

(b) *Selection of sample locations—general.* (1)(i) Use a square-based grid system to overlay the entire area to be sampled. Orient the grid axes on a magnetic north-south line centered in the area and an east-west axis perpendicular to the magnetic north-south axis also centered in the area.

(ii) If the site is recleaned based on the results of cleanup verification conducted in accordance with §761.61(a)(6), follow the procedures in paragraph (b) of this section for locating sampling points after the recleaning, but reorient the grid axes established in paragraph (b)(1)(i) of this section by moving the origin one meter in the direction of magnetic north and one meter in the direction east of magnetic north.

(2) Mark out a series of sampling points 1.5 meters apart oriented to the grid axes. The sampling points shall proceed in every direction to the extent sufficient to result in a two-dimensional grid completely overlaying the sampling area.

(3) Collect a sample at each point if the grid falls in the cleanup area. Analyze all samples either individually or according to the compositing schemes provided in the procedures at §761.289. So long as every sample collected at a grid point is analyzed as either an individual sample or as part of a composite sample, there are no other restrictions on how many samples are analyzed.

(c) *Selection of sample locations—small cleanup sites.* When a cleanup site is sufficiently small or irregularly shaped that a square grid with a grid interval of 1.5 meters will not result in a minimum of three sampling points for each type of bulk PCB remediation waste or porous surface at the cleanup site, there are two options.

(1) Use a smaller square grid interval and the procedures in paragraph (b) of this section.

(2) Use the following coordinate-based random sampling scheme. If the site is recleaned based on the results of cleanup verification conducted in accordance with §761.61(a)(6), follow the procedures in this section for locating sampling points after the recleaning, but select three new pairs of sampling coordinates.

(i) Beginning in the southwest corner (lower left when facing magnetic north) of the area to be sampled, measure in centimeters (or inches) the maximum magnetic north-south dimension of the area to be sampled. Next, beginning in the southwest corner, measure in centimeters (or inches) the maximum magnetic east-west dimension of the area to be sampled. Designate the north-south and east-west dimensions (describing the west and south boundaries, respectively, of the area to be sampled), as the reference axes of a square-based grid system.

(ii) Use a random number table or random number generator to select a pair of coordinates that will locate the sample within the area to be sampled. The first coordinate in the pair is the measurement on the north-south axis. The second coordinate in the pair is the measurement on the east-west axis. Collect the sample at the intersection of an east-west line drawn through the measured spot on the north-south axis, and a north-south line drawn through the measured spot on the east-west axis. If the cleanup site is irregularly shaped and this intersection falls outside the cleanup site, select a new pair of sampling coordinates. Continue to select pairs of sampling coordinates until three are selected for each type of bulk PCB remediation waste or porous surface at the cleanup site.

(d) *Area of inference.* Analytical results for an individual sample point apply to the sample point and to an area of inference extending to four imaginary lines parallel to the grid axes and one half grid interval distant from the sample point in four different directions. The area of inference forms a square around the sample point. The sides of the square are parallel to the grid axes and one grid interval in length. The

sample point is in the center of the square area of inference. The area of inference from a composite sample is the total of the areas of the individual samples included in the composite.

§761.286 Sample size and procedure for collecting a sample.

At each selected sampling location for bulk PCB remediation waste or porous surfaces, collect at least 20 milliliters of waste, or a portion of sufficient weight for the chemical analyst to measure the concentration of PCBs and still have sufficient analytical detection sensitivity to reproducibly measure PCBs at the levels designated in §761.61(a)(4). Use a core sampler having a diameter ≥2 cm and ≤3 cm. Collect waste to a maximum depth of 7.5 cms.

§761.289 Compositing samples.

Compositing is a method of combining several samples of a specific type of bulk PCB remediation waste or porous surface from nearby locations for a single chemical analysis. There are two procedures for compositing bulk PCB remediation waste samples. These procedures are based on the method for selecting sampling site locations in §761.283(b) and (c). The single chemical analysis of a composite sample results in an averaging of the concentrations of its component samples. The area of inference of a composite is determined by the area of inference of each of its component samples as described in §761.283(d). Compositing is not mandatory. However, if compositing is used, it must be performed in accordance with the following procedures.

(a) *Compositing in the field or in a laboratory.* Compositing may occur either in the field or in a laboratory. Prepare composite samples using equal volumes of each constituent or component sample. Composited samples must be from the same type of bulk PCB remediation waste or porous surface (see the example at §761.283(a)(2)). Mix composite samples thoroughly. From each well-mixed composite sample, take a portion of sufficient weight for the chemical analyst to measure the concentration of PCBs and still have sufficient analytical detection sensitivity to reproducibly measure PCBs at the levels designated in §761.61(a)(4).

(b)(1) *Compositing from samples collected at grid points in accordance with §761.283(b).* There are two kinds of composite sampling procedures depending on the original source of contamination of the site.

(i) The first procedure is for sites with multiple point sources of contamination (such as an old electrical equipment storage area, a scrap yard, or repair shop) or for unknown sources of contamination. Under this compositing scheme, composite a maximum of nine samples for each type of bulk PCB remediation waste or porous surface at the cleanup site. The maximum dimensions of the area enclosing a nine grid point composite is two grid intervals bounded by three collinear grid points (3.0 meters or approximately 10 feet long). Take all samples in the composite at the same depth. Assure that composite sample areas and individually analyzed samples completely overlay the cleanup site.

(ii) The second procedure is for a single point source of contamination, such as discharge into a large containment area (e.g., pit, waste lagoon, or evaporation pond), or a leak onto soil from a single drum or tank. Single point source contamination may be from a one-time or continuous contamination. Composites come from two stages: an initial compositing area centered in the area to be sampled, and subsequent compositing areas forming concentric square zones around the initial compositing area. The center of the initial compositing area and each of the subsequent compositing areas is the origin of the grid axes.

(A) *Definition of the initial compositing area.* The initial compositing area is based on a square that contains nine grid points, is centered on the grid origin, and has sides two grid intervals long. The initial compositing area has the same center as this square and sides one half a grid interval more distant from the center than the square. The initial compositing area has sides three grid intervals long.

(B) *Definition of subsequent compositing areas.* Subsequent composite sampling areas are in concentric square zones one grid interval wide around the initial compositing area and around each successive

subsequent compositing area. The inner boundary of the first subsequent compositing area is the outer boundary of the initial compositing area. The outer boundary of the first subsequent compositing area is centered on the grid origin, has sides one grid interval more distant from the grid origin than the inner boundary, and is two grid intervals longer on a side than the inner boundary. The inner boundary of each further subsequent compositing area is the outer boundary of the previous subsequent compositing area. The outer boundary of each further subsequent compositing area is centered on the grid origin, has sides one grid interval more distant from the grid origin than the inner boundary, and is two grid intervals longer on a side than the inner boundary.

(C) *Taking composite samples from the initial and subsequent compositing areas.* (*1*) Select composite sampling areas from the initial compositing area and subsequent compositing areas such that all grid points in the initial compositing area and subsequent compositing areas are part of a composite or individual sample.

(*2*) A person may include in a single composite sample a maximum of all nine grid points in the initial compositing area. The maximum number of grid points in a composite sample taken from a subsequent compositing area is eight. These eight grid points must be adjacent to one another in the subsequent compositing area, but need not be collinear.

(2) *Compositing from samples taken at grid points or pairs of coordinates in accordance with §761.283(c).* Samples collected at small sites are based on selecting pairs of coordinates or using the sample site selection procedure for grid sampling with a smaller grid interval.

(i) *Samples collected from a grid having a smaller grid interval.* Use the procedure in paragraph (b)(1)(i) of this section to composite samples and determine the area of inference for composite samples.

(ii) *Samples collected from pairs of coordinates.* All three samples must be composited. The area of inference for the composite is the entire area sampled.

§761.292 Chemical extraction and analysis of individual samples and composite samples.

Use either Method 3500B/3540C or Method 3500B/3550B from EPA's SW-846, Test Methods for Evaluating Solid Waste, or a method validated under subpart Q of this part, for chemical extraction of PCBs from individual and composite samples of PCB remediation waste. Use Method 8082 from SW-846, or a method validated under subpart Q of this part, to analyze these extracts for PCBs.

§761.295 Reporting and recordkeeping of the PCB concentrations in samples.

(a) Report all sample concentrations for bulk PCB remediation waste and porous surfaces on a dry weight basis and as micrograms of PCBs per gram of sample (ppm by weight).

(b) Record and keep on file for 3 years the PCB concentration for each sample or composite sample.

§761.298 Decisions based on PCB concentration measurements resulting from sampling.

(a) For grid samples which are chemically analyzed individually, the PCB concentration applies to the area of inference as described in §761.283(d).

(b) For grid samples analyzed as part of a composite sample, the PCB concentration applies to the area of inference of the composite sample as described in §761.283(d) (i.e., the area of inference is the total of the areas of the individual samples included in the composite).

(c) For coordinate pair samples analyzed as part of a composite sample, in accordance with §§761.283(c)(2) and 761.289(b)(2)(ii), the PCB concentration applies to the entire cleanup site.

Appendix B

Site Health and Safety Plan

Site Health and Safety Plan
for
PCB Transformer Removal and Cleanup
at the
Country Club of the Pacific
Yona, Guam

Prepared by:

Unitek Environmental Guam
P.O. Box 24607
Barrigada, Guam 96921

Prepared by:

Brad C. Wolfe
Site Safety Officer

Reviewed by

LeRoy Moore
Project Manager

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1.0 Introduction

This removal action consists removal and disposal of three polychlorinated biphenyls (PCBs) containing pad mounted transformers, PCB oil and excavation and removal of PCB impacted soil from Country Club of the Pacific (CCP) Golf Course, Yona, Guam.

This Site Health and Safety Plan (SHSP) established the policies and procedures that will be used to protect workers and the public from potential hazards posed by work at this site. Unitek policy emphasizes safety during work at a site containing potentially hazardous materials and requires minimizing exposure to the extent possible on all projects. All project activities will be conducted to minimize the probability of injury, accident, or incident occurrence. All employees, subcontractors, and vendors will be required to read and sign the SHSP prior to site entry. All personnel on site, including Contractors and subcontractor personnel, will be required to comply with the SHSP.

1.1 Referenced Documents

This SHSP and all site activities will comply with the following regulations and guidelines:

- United States Department of Labor, Occupational Safety and Health Administration (OSHA) specifically:

  29 Code of Federal Regulations (CFR) 1910.120—Hazardous Waste Operations and Emergency Response.

  29 CFR 1910.1200—Hazard Communication

  29 CFR 1926—Safety and Health Regulations for Construction

- National Institute for Occupational Safety and Health (NIOSH)/Occupational Health and Safety Administration/U.S. Coast Guard (USCG)/U.S. Environmental Protection Agency. 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

- American National Standards Institute (ANSI). Practice for Respiratory Protection,
  Z88.2 and demolitions Operation-Safety Requirements, A10.6.

Although this SHSP focuses on the specific work activities planned for this site, it must remain flexible because of the nature of this work. Conditions may change and unforeseen situations may arise that require deviations from the original plan. The Unitek Project Supervisor and health and safety (H&S) personnel may need to modify the policies and procedures due to changes in site conditions, unforeseen weather, and deviations to the scope of work.

This SHSP takes into account the information currently available from discussions with the project management team and materials provided to Unitek. This SHSP has been written according to OSHA requirements, specifically 29 CFR 1910.120.

1.2 Site Location and Background

The CCP golf course is located in Yona, Guam near Guam's southeastern coast and the transformer locations are shown below:

Club of the Pacific Transformer Location Map.

The project location and planned site layout figures are included in the Site Work Plan.

Testing conducted of the oil contained within the disposal drums for waste characterization identified the three abandoned transformers at the site contained oil with concentrations of PCBs of 1450 ppm , 2550 ppm and 1570 ppm. The transformer identified as Transformer 1 (serial# 07291763) did not have signs of any oil leaks. The other two transformers were found with oil stains outside the transformers and with less oil inside than indicated on the data plate. After removal of all liquids from the subject transformers into DOT approved drums for disposal, it was estimated that the amount of oil removed was estimated approximately 100 gallons less than was listed on the data plate for Transformer #3 (serial # 07291765) and approximately 45 gallons less than was

listed on the data plate for Transformer #2 (serial # 07291764) (Unitek, December, 2013). Based on the data plate information, the transformers are of Japanese manufacture by Kitashiba Electric Co. LTD of Japan in 1972. Laboratory analysis of the oil indicated PCBs of Japanese origin resembling laboratory standards for PCB oil products known as Kanechlor-300 and/or Kanechlor-400.

The objectives of this project are to properly remove and dispose of the three PCB transformers, dispose of PCB containing oil/water/soil, and restore the site so that surface and subsurface PCB concentrations in soil are below the Toxic Substance Control Act (TSCA) Low Occupancy Area, Title 40 Code of Federal Regulations (CFR) 761.61 cleanup criteria of 25 mg/kg (50 or 100 mg/kg with site controls). Successful completion of this project will eliminate the potential PCB source from the site, prevent further migration of contaminants at the site and will mitigate potential risk to site users and ecological receptors from exposure to PCBs.

1.3 Site Characteristics

The area identified for removal action starts is within an operational golf course. The removal of transformers and associated oil drums will require the materials be transported through the golf course on flat bed truck. Transformers 1 and 2 are relatively isolated from golfing operations by thick vegetation. Transformer #3 is inside the active golfing zone of the golf course making isolation and security of the work area critical for the safety of other site occupants.

Three excavation zones with PBC contamination are expected to be in close proximity (within 10 feet) of Transformers 2 and 3. The levels of PCBs detected in the Transformer oils released from transformers 2 and 3 were 2550 mg/kg and 1570mg/kg respectively. PCBs are the main contaminant of concern (COC) for employee exposure while working in the excavation areas at this site. PCB impacted soils to be removed from the site will consist of clay and limestone.

1.4 Scope of Work

The objective of the project is to remove PCB transformers, oil and PCB impacted concrete/soil. All required planning documents will be prepared and approved prior to the start of field operations The field work for this project consists of the following definable features or work, which are addressed in this work Plan:

- Mobilizing equipment and personnel, and setting up temporary field facilities.
- Removal and disposal of 3 PCB transformers and drummed oil.
- Remove, package and dispose of contaminated concrete pads and visually contaminated soil under transformers.
- Establishing sampling grid per 40CFR Part 761 Subpart N and Subpart O.

- Preparing the site for removal action including trimming vegetation for access, and identification of lay down and work areas..
- Install and maintain environmental and engineering controls.
- Establishing work zones at the site including exclusion zone, contamination reduction zone and support zones.
- Excavate, package and transport contaminated soil from the site and transport back to the site treated soil as fill material.
- Perform characterization and verification sampling following removal action per 40 CFR Part 761 Subpart N and Subpart O.
- Prepare site maps to include final excavations and locations of verification sampling.
- Characterize all wastes generated during removal action.
- Transporting and disposing of PCB contaminated soil to an off-island EPA permitted PCB disposal facility.
- Dispose of all non hazardous debris generated from projects activities at the site.
- Site Restoration to include filling excavations with sufficient clean (less than 1ppm PCBs) return soil to return the site to original grade.
- Demobilizing personnel and equipment.
- Prepare final After Action Report documenting the successful completion of the site cleanup.

2.0 Key Personnel and Management

All employees, and authorized visitors will be provided with information and procedures to protect themselves and the adjacent community from potential adverse effects work at the site involving potentially hazardous substances. All personnel involved with this project will follow the procedures set forth in this SHSP. Visitors will not be granted entry unless they read and agree to comply with this plan and meet the minimum qualifications required to be inside the site perimeters. The SHSP acknowledgement form will be signed by all whom actively participate at this project. Responsibilities, duties, and authorities for key personnel are discussed below.

2.1 Project Manager

The Unitek Project Manager, Mr. LeRoy Moore, will communicate directly with the CCP management and serve as the primary point of contact during the project. His responsibilities will include project scheduling, cost updating, providing overall project direction, and overseeing site safety. In addition, the Project Manager will be responsible for determining the extent and level of input required for technical issues that arise during the tenure of the project. The Project Manager's direct subordinate in the chain-of-command will be Project Supervisor for site activities.

2.2 Site Manager/Safety Officer

The SSO for this project will be Mr. Brad Wolfe. Mr. Wolfe has over 23 years experience related to project management and health and safety implementation at Unitek Environmental Guam. He will implement and enforce the project safety program and procedures for this project. The SSO will conduct the daily safety meetings and will interface as required with other site representatives. The SSO will perform duties such as confirming that personnel are fit for duty, coordinating medical care, establishing communications with emergency responders, conducting daily safety inspections, and inspecting health and safety equipment. The SSO has the authority to stop unsafe operations and to remove unqualified personnel from the work area.

In addition, the SSO will be responsible for ensuring the proper maintenance of safety equipment, providing site orientation safety training for all personnel actively involved in site work, and maintaining other site safety documentation. The SSO will take the following action(s) when appropriate:

- Order the immediate shutdown of site activities in the event of a medical emergency or unsafe practice.
- Ensure that protective clothing and equipment are properly stored, used, and maintained
- Ensure that environmental and personnel monitoring operations are ongoing and that they comply with the technical specifications and required procedures.
- Restrict visitors from areas of potential exposures to harmful substances

The SSO will be responsible for implementing and enforcing the project site safety program and procedures. The SSO will oversee any personnel monitoring and decide when action levels have been reached that require more stringent personnel protection. The SSO will establish and enforce the personal protective equipment (PPE) requirements for site activities. The SSO will maintain daily contact with the Project PM. In the event the SSO becomes unavailable during any portion of the project Site Supervisor will assume the duties of the SSO and fill in as needed.

2.3 Project Site Supervisor

The Project Supervisors will also be responsible for conducting all on-site operations according to the directions of the Project Manager, contract specifications, and applicable safety guidelines. The Site Superintendent will provide a safe work environment for employees and contractors. He will ensure that each employee understands the safety procedure involved with each task (including that personnel are properly trained and the proper PPE is used), and immediately correct unsafe conditions. The Site Superintendent is required to coordinate all health and safety issues with the designated SSO and will assume the duties and responsibilities of the SSO when that individual is not on site. The Site Superintendent will also watch for ill effects on any of the crew members, especially those symptoms potentially caused by heat stress or chemical exposure. The Site Superintendent will oversee the safety of any visitors who enter the site.

2.4 Equipment Operators

Equipment Operators will be responsible for the safety operation of the equipment, daily safety inspections of the equipment, and scheduling preventive maintenance service to ensure equipment remains in safe running condition.

2.5 Employee Safety Responsibility

Although the employer is responsible for providing a safe healthful work place, each employee is critical to the safety of operations. The employee shall be responsible to work in a manner so as no to endanger themselves, fellow employees, contractor employees, neighbors, the environment, equipment, and properly. The employee shall do the following:

- Be familiar with the SHSP and general safety rules.
- Practice safe procedures and follow all safety rules and regulations for the successful completion of any job task.
- Wear the necessary PPE required for the job task.
- Notify the immediate supervisor of any potential hazard or unsafe work practice that could result in injury or destruction of property.
- Report all accidents to the immediate supervisor regardless of whether injury or property damage resulted (this includes near misses).
- Report the use of prescribed medication that could affect work performance prior to beginning work.

2.6 Logs, Reports, and Record Keeping

The site safety log is the primary quality assurance (QA)/quality control (QC) record for health and safety activities on site. The following items will be developed as applicable and maintained by the SSO as part of the site safety:

- Daily safety meetings
- Hazard communication checklists/Safety Data Sheets
- Documentation of warning given related to safety infractions
- Copies of accidents reports
- Activity Hazard Analysis (AHA) forms
- Employee training, respirator fit test, and medical certificates

3.0 Activity Hazard Analysis

This section discusses chemical, physical, and environmental hazards to workers on the site. Section 3.1 discusses the contaminant, its exposure limits, and the signs and symptoms of exposure. Section 3.2 discusses physical hazards identified for the work at this site, including those associated with construction, the use of heavy equipment and fire hazard. Environmental hazards, discussed in section 3.3, are associated with the physical location of the site and weather conditions, as well as heat stress, noise, and flora and fauna contact. Section 3.4 discusses the risks and precautions associated with each task identified in the Work Plan.

Daily safety meetings will be held each day, prior to the remediation activity for that day. Attendance at these meetings will be documented on the daily safety meeting form.

An Activity Hazard Analysis (AHA) has been prepared for each work activity. The AHA identifies the sequence of work, the specific hazards anticipated, and the control measures that will be used to minimize or eliminate each hazard. The hazard control information in the AHA will be presented at the daily safety meeting for each activity to be performed that day. The prepared AHAs for this project are presented in Attachment 2 of this SHSP.

3.1 Chemical Hazards

PCBs are the main contaminant of concern (COC) for employee exposure while working in the excavation areas at this site. Table 3-1 “Chemical Hazards Assessments.” Summarizes the chemical hazard posed by this COC. Material Safety Data Sheets (MSDSs) for any chemical brought onto site will be acquired a review with all personnel during daily safety meetings. Levels of protection and air monitoring requirements will be based initially on the data provided or obtained to remediation work. These requirements may change as site conditions are more fully evaluated.

Table 3-1 Chemical Hazards Assessment

Chemical Name	PEL	Action Level	Route of Exposure	Signs and Symptoms of Exposure
Particulates	**5.0 mg/m3** (respirable fraction) **15 mg/m3 Total**	1.0 mg/m3 in (exclusion zone) 0.15 mg/m3 (site perimeter)	Skin contact inhalation,	Irritation of the eyes, skin, and upper respiratory tract. Target organs: eyes, skin respiratory tract.
PCB	**0.5 mg/m3** (skin)		Skin contact inhalation, ingestion	Irritation of the eyes, skin, and upper respiratory tract, headaches, dizziness peripheral neuropathy. Chronic exposures may result in chloracne, gastrointestinal disturbances, nausea, and vomiting. Target organs eyes, skin, blood, immune system, lungs, CNS.

PEL denotes permissible exposure limit.
mg/m3 denotes milligram per cubic meter of air.

3.1.1 Chemical Hazard Assessment

The excavation of the soil will result in exposing potential contaminants. The chemical of potential concern is PCB. The contaminant or concern is generally not volatile in nature and is dispersed in the soil matrix. Therefore, the greatest concern during excavation would be the generation of PCB containing dust which could expose employees through exposure through skin contact or inhalation.

The workers within the open excavation zone will don modified Level D PPE with disposable coveralls and nitril coated work gloves or Nitrile gloves. Safe work practices will be used, such as controlling dust and avoiding direct contact with the contaminated soil, to prevent workers from potential exposure and to prevent the spread of contamination off site. Employees will also be required to wear protective equipment and remove or decontaminate their protective equipment and body as necessary prior to leaving the decontamination reduction zone.

Exposures during the project would be expected to be greatest during the excavation portion of the project. Real time monitoring with conservative action levels will be used to determine exposure control requirements. Air monitoring is discussed in detail in Section 7 of this SSHP.

3.2 Physical Hazards

Numerous physical hazards are associated with this project which, if not identified and addressed, could cause accidents and personnel injury to the work force, as well as operational problems. To minimize physical hazards, standard safety protocols will be followed at all times. Crew members who fail to follow safety protocols or neglect these policies will be expelled from site and may face termination of employment.

All project personnel will be familiar with the field activities that they will be involved in at the site. They are trained to work safely under various conditions. In addition, the Project Supervisor will observe the general work practices of each crew member and Equipment Operator and enforce procedures to minimize physical hazards. Personnel will be required to wear hard hats, safety glasses with side shields, and steel-toed boots in all areas of the sites. In addition high visibility clothing will be worn when heavy equipment is working on site.

3.2.1 Tripping, Slipping, and Falling Hazards

Items that could cause slips, trips, and falls are common hazards at project sites. To minimized trip, slip, and fall hazards, the following requirements will be implemented:

- Personnel shall keep the working area clean and orderly (job supplies, equipment, and material will be removed daily from the work areas).
- Walkways shall be kept free of obstacles.
- Obvious trip hazards such as protruding roots, vegetation uneven ground or holes/excavations will be removed, filled, marked or barricaded as appropriate.
- Spills shall be cleaned up immediately.
- Personnel shall not jump from elevated places or the backs of trucks or equipment.
- Personnel using hand and mechanical tools shall position themselves properly, consider leverage, and events if tools is suddenly moved.
- Personnel shall not walk or climb on any equipment not designed as walking surfaces.
- Electrical extension cords and electrical wiring must be kept clear of walking and working areas and/or covered, buried, or otherwise secured.
- Running is prohibited on job sites unless under emergency conditions.

3.2.2 Head and Back Injuries

Hard hats will be worn as part of the standard PPE ensemble within designated work areas. To prevent back injuries, all personnel will use mechanical lifting devices whenever practical. If the material must be lifted manually, personnel shall warm up for the lift by bending, stretching, and inspect the intended lifting area to make sure there are no obstacles posing a hazard during the lift. Employees should not attempt to lift more than 60 pounds each, and use proper lifting techniques. Proper lifting techniques shall be reviewed by the SSO and/or Site Supervisor.

3.2.3 Falling Objects

Personnel will be kept clear and maintain safe distance to of any area where falling objects may pose a hazard such as any suspended loads. The field activities will be designed to prevent any object, regardless of size, from free falling to the ground. The SSO/Supervisor will ensure that an adequate area is clear of personnel while the equipment is in operation.

3.2.4 Heavy Equipment and Traffic

Personnel shall where high visibility clothing when heavy equipment is working on site. The use of heavy equipment for transformer removal, excavation, and lifting poses the greatest potential for physical injury to personnel and property. All vehicles will have spotters for backing maneuvers and traffic control. Strict traffic patterns and site control will be established at the work site. Only qualified personnel will be allowed to operate heavy equipment. Only these crew members directly involved with spotting for the Operator will be allowed in the vicinity of the heavy equipment. All others will remain a safe distance away from these operations.

Personnel needing to approach heavy equipment that is operating will observe the following protocols:

- Make eye contact with the Operator or the spotter
- Signal the Operator to cease the heavy equipment activity
- Approach the equipment after equipment has stopped moving and inform the Operator of Intentions

- Project personnel will follow all traffic laws.

3.2.4.1 Site Pre-inspection of Equipment

Project personnel will only use heavy equipment that is safe working order. To maintain this policy, all equipment brought onto the project site will be inspected for structural integrity, smooth operational performance, and proper functioning of all critical safety devices according to manufacturer specifications. This inspection will be performed by the Equipment Operator.

All equipment not conforming to the operational and safety requirements set forth during this inspection will not be put into service until all necessary repairs are made.

3.2.4.2 Operator Qualifications

Permission to operate equipment will be granted only to qualified Operators familiar with the equipment to be used. Any Operator may be removed from the project site as a result of unsafe operations or doubts arise concerning the capabilities of that Operator.

3.3 Environmental Hazards

Environmental hazards associated with this site will be discussed at the orientation meeting prior to startup of remediation activities. Personnel will be apprised of symptoms of exposure to certain biological hazards, heat stress, and high wind conditions and lightning producing storms.

3.3.1 Weather and Heat Stress

If severe lightning producing storms appear work at the site will stop and personnel will seek cover until the threat passes. If typhoon conditions are declared (with damaging winds expected within 24 hours) work will be performed to secure the site and personnel will evacuate the site until the threat passes.

With the possible combination of ambient factors such as high air temperature, high relative humidity, low air movement, high radiant heat, and protective clothing, the potential for heat stress is a concern. The potential exists for the following conditions in Table 3-2:

Table 3-2 Identification and Treatment of Heat Related Illness

Type of Heat-Related Illness	Description	First Aid
Mild Heat Strain	The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.	*Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. *If an air-conditioned spot is available, this is an ideal break location. *Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.
Heat Exhaustion	Usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim will have pale, clammy moist skin and may perspire profusely. The pulse is weak and fast and the victim may faint unless they lie down. The bowels may move involuntarily.	*Immediately remove the victim from the work area to a shady or cool area with good air circulation (avoid drafts or sudden chilling). *Remove all protective outerwear. Call a physician. *Treat the victim for shock. (Make the victim lie down, raise his or her feet 6–12 inches, and keep him or her cool by loosening all clothing). *If the victim is conscious, it may be helpful to give him or her sips of water. *Transport victim to a medical facility as soon as possible.
Heat Stroke	The most serious of heat illness, heat stroke represents the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104 degrees Fahrenheit or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, and nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly and death is imminent if exposure continues. Heat stroke can occur suddenly.	*Immediately evacuate the victim to a cool and shady area. *Remove all protective outerwear and as much personal clothing as decency permits. *Lay the victim on his or her back with the feet slightly elevated. *Apply cold wet towels or ice bags to the head, armpits, and thighs. *Sponge off the bare skin with cool water or rubbing alcohol, if available. *The main objective is to cool without chilling the victim. *Give no stimulants or hot drinks. Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide onsite treatment of the victim and proper transport to a medical facility.

Heat stress awareness will be emphasized during daily safety meetings. The Site Superintendent and SSO will work together to monitor heat stress situations and to modify work practices and schedules accordingly.

Workers will be encouraged to increase consumption of water and electrolyte-containing beverage, such as Gatorade®, during warm weather. Drinking water

will be provided on site and will be available for consumption during working breaks.

At a minimum, workers will break every 2 hours for 10- to 15-minutes rest periods. The frequency and duration of breaks will be increased as necessary based on the methods described in Section 3.3.2.

3.3.1.2 Adjusted Temperature Method

This method can be utilized where Wet Bulb Globe Thermometer Monitoring is not available, and requires only that the ambient temperature (in degrees Fahrenheit) and relative humidity be known. Adjustment factors are applied to the ambient temperature to account for departures from ideal conditions (sunny conditions, light winds, moderate humidity and a fully acclimated work force). The adjustments should be made by addition or subtraction to the ambient temperature reading, or changes in table position, as indicated in Table 3-3. Adjustments are independent and cumulative, all applicable adjustments should be applied. The result is the *Adjusted Temperature*, which can be compared with the values in Table 3-4 for the applicable work rate (where light work corresponds to minimal physical activity besides standing/watching, very heavy work corresponds to significant, continuous physical labor) to determine the work-rest frequency.

Table 3-3 Temperature Adjustment Factors

Time of Day	Temperature Adjustment Factors
Before daily temperature peak(1)	+2
10 am – 2 pm (peak sunshine)	+2
Sunshine	
No clouds	+1
Partly Cloudy (3/8 – 5/8 cloud cover)	-3
Mostly Cloudy (5/8 – 7/8 cloud cover)	-5
Cloudy (>7/8 cloud cover)	-7
Indoor or nighttime work	-7
Wind (ignore if indoors or wearing CPC)	
Gusts greater than 5 miles per hour at least once per minute	-1
Gusts greater than 10 miles per hour at least once per minute	-2
Sustained greater than 5 miles per hour	-3
Sustained greater than 10 miles per hour	-5
Humidity (ignore if wearing CPC)	
Relative Humidity greater than 90%	+5
Relative humidity greater than 80%	+2
Relative Humidity less than 50%	-4

Note: 1) This adjustment accounts for temperature rise during the day. If the temperature has already reached its daytime peak, it can be ignored.

Table 3-4 Work Rest Schedule Based on Adjusted Temperature

Work-Rest Schedule	Adjusted Temperature (degrees F)			
	Light Work	Moderate Work	Heavy Work	V. Heavy Work
No specified break	<80	<75	<70	<65
15 minute break 90 minutes work	80-90	75-85	70-80	65-75
15 minute break 60 minutes work	>90-100	>85-95	>80-85	>75-80
15 minutes break 45 minutes work	>100-110	>95-100	>85-90	>80-85
15 minutes break 30 minutes Work	>110-115	>100-105	>90-95	>85-90
15 minutes break 15 minutes work	>115-120	>105-110	>95-100	>90-95
Stop work	**>120**	**>110**	**>100**	**>95**

3.3.1.3 Evaluating the Work-Rest Schedule's Effectiveness

The intent of the Work-Rest Schedule is to provide effective administrative controls to preclude exposure to heat stress, as much as possible. Once a work-rest schedule is established, the work supervisor must continually evaluate its effectiveness through observation of workers for signs/symptoms of heart stress. Measurement of each worker's pulse and temperature can provide additional information in determining if the schedule is adequate, and is accomplished as follows: At the start of the workday each worker's baseline pulse rate (in beats per minute – bpm) is determined by taking a pulse count for 15 seconds and multiplying the result by four. Worker pulse rates can then be measured at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- Each worker's maximum heart rate at the start of any break should be less than [180 minus workers age] bpm. If this value is exceeded for any worker, the duration of the following work period will be decreased by at least 10 minutes.
- At the end of each work period, all workers' heart rates must have returned to within +10% of the baseline pulse rate. If any worker's pulse rate exceeds this value the break period will be extended for at least 5 minutes, at the end of which pulse rates will be re-measured and the end-of-break criteria again applied.

3.3.2 Hearing Conservation

Areas where noise levels exceed 85 dBA (8hr time weighted average)will have signs posted that specify the need for hearing protection. Equipment to be used for this project has been evaluated and high noise activities are not anticipated for this project.

Hearing protection will be available to all employees if noise does become a concern. The SSO will monitor sound levels on site if necessary. Generally,

hearing protection should be worn whenever personnel have to raise their voices to be heard at an arm's distance or when required by the SSO or Project Supervisor. If there is any doubt regarding high noise levels, implement hearing conservation measures and evaluate workers with an OSHA compliant meter. All employees have annual audiograms.

3.3.3 Biological Hazards

The following biological hazards may be encountered on site, although such encounters are not anticipated to pose a significant risk to site personnel:

- **Animal bites and insect stings—**These can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. Some individuals, however, may experience serious effects such as anaphylactic shock, which can lead to severe reactions in the circulatory, respiratory, and central nervous systems, and in some cases, can cause death. The SSO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting. No attempts should be made to capture any animals due to the possibility of a bite or parasitic infestation.

- **Animal and bird dropping—**These often contain mold, fungus, or bacteria, which present significant respiratory hazards including lungs diseases and allergies. Personnel will be instructed not to expose themselves to such hazards.

- **Hazardous plants—**Personnel will be warned to prevent contact with unknown plants. Protective clothing will be worn by site personnel to reduce the probability of such exposure. Workers who do experience exposure should clean the skin thoroughly with soap and water after contact, to reduce the risk of severe symptoms.

- **Blood borne pathogens (BBP)—**An exposure potential exists whenever bodily fluids such as blood or saliva are exchanged between individuals. If first aid must be rendered on site, the BBP trained responder will don latex gloves and safety glasses, at a minimum, if the potential for bodily fluid exchange exists. A BBP kit will be available on-site along with a first aid kit. The used materials will be placed in labeled biohazard bags and disposed of properly.

3.4 Task-Specific Hazards

Activity Hazard Analyses (AHA)s discuss the risks and hazards specific to the tasks identified in the Work Plan. AHAs have been developed for each of the tasks anticipated during this project and are included in Attachment 2, "Activity Hazard Analyses". Each

AHA will be reviewed prior to the start of an activity and be used as a guide to the during each activity to identify hazards and recommended controls for each during the project.

4.0 Work and Support Areas

To prevent contamination from being transported outside of the work area by personnel or equipment, work areas PPE will be clearly specified prior to beginning operations. Work areas or zones have been designed as suggested by the NIOSH/OSHA/USCG/EPA document Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

Access to project site will be controlled and visitors will sign the HSHP after review. Three zones will be demarked: an exclusions zone (EZ) or "hot" zone, a contamination reduction zone (CRZ), and a support zone (SZ). Orange construction safety fencing will be installed around the entire excavation area and will delineate the boundaries of the EZ and the CRZ.

4.1 Exclusion Zone

The EZ will consist of areas where inhalation, oral contact, or dermal contact with contaminants will be possible, and areas where removal activities will occur. The EZ perimeter will be secured with the orange safety fence physical barrier at least two feet outside the edge of all intended excavation boundaries. Permission to enter the EZ will be limited to those individuals with the proper training, medical certification, and PPE.

4.2 Contamination Reduction Zone

The CRZ, or transition zone, will be established between the EZ and support zone. In this area, personnel will begin the sequential decontamination process required to exit the EZ. To prevent off-site migration of contamination and to maintain personnel accountability, all personnel will enter and exit the EZ through the CRZ.

4.3 Support Zone

The support zone will consist of an area adjacent to the CRZ where support equipment, and sanitation facilities (toilets, drinking water, washing water fire extinguishers, and first aid kits) are staged. Smoking, drinking, and eating will be allowed only in designated areas in the support zone.

4.4 Access Controls

The SSO and the Site Supervisor will establish the physical boundaries of each zone and instruct all workers and visitors on the limits of the restricted areas. No one shall be allowed to enter the restricted area without the required protective equipment for that area. The Project Supervisor shall ensure compliance with all

restricted area entry and exit procedures. The Project Supervisor shall also designate a decontamination point for personnel to exit the contaminated area and enter the clean area to rest and drink.

4.5 Visitor Access

Visitors will be required to check in immediately upon arrival with the Site Supervisor. Only authorized visitors will be allowed access to the EZ. All visitors with access to EZ must submit proof of 40-hour OSHA HAZWOPER training and current medical certification to Unitek staff or 24-hour Certificate for certain limited task personnel. Each visitor will be required to provide and wear the necessary PPE during the visits and shall be escorted by project personnel. All visitors, subcontractors and personnel will be required to sign a Safety Plan Acknowledgment Sheet to certify that they have read, understand, and will comply with this SHSP. Failure to comply with this site entry procedure will result expulsion from the site. The Site Supervisor or designee will keep a visitor log.

4.6 Buddy System

A buddy system will be implemented when conditions represent a physical or chemical risk to personnel. The buddy system will require that two or three people work as a team, each looking out for the other. Buddies must always be within each other's line of sight and maintain verbal or visual communication.

5.0 Personal Protective Equipment

Unless otherwise approved by the SSO all activities at the site will require American National Standards Institute (ANSI) approved hard hat, Safety-toe footwear, Safety glasses and high visibility vests or shirts when heavy equipment traffic hazards are present. EPA Level D and Level C are the potential levels of protection for this project.

The EPA-specified levels of protection are as follows:

Level A Used when the greatest level of skin, eye, and respiratory protection is needed and consists if a totally encapsulated suit with supplied breathing air.

Level B Used when the highest level of respiratory protection is needed but a lesser level of skin protection (than Level A encapsulated suit) is required. Splash suits may include chemical protective clothing, such as rain suits, or less resistant disposable materials, such as Tyvek®, polycoated Tyvek®, or equivalent, for duties involving minimal contamination.

Level C Used when criteria for air-purifying respirators and skin protection are met.

Level D Used only as a work uniform in areas without respiratory hazards.

It is not anticipated that air purifying respirators will be required to be worn during the excavation portion of this project. Due to the relatively low detected concentrations of PCBs in the released oil at the site, the action levels for PCB dust are not expected to be reached during excavation. This rational is further explained in Section 7 "air monitoring".

5.1 Reassessment of Personal Protection Equipment

The levels of protection listed in this section may be upgraded or downgraded based on action levels from direct-reading instruments, a change in site conditions, findings from investigation. If the level of protection is to be downgraded, personnel will continue to work in the original levels of protection until the SSO and the Project Manager of Project Supervisor has discussed air monitoring results and the rationale for downgrade. The levels of protection for any task may be upgraded at any time and documented.

6.0 Decontamination Procedures

This section describes the procedures that will be used to ensure that both personnel and equipment are free from contamination when they leave the work site. Section 6.1, "Personnel Decontamination," presents a step-by-step description of decontamination procedures for EPA Level D. The project activities will be conducted in Level D or Modified Level D PPE, which may include protective gloves, clothing, and foot covers.

6.1 Personnel Decontamination

Personnel will be decontaminated to ensure that any material contacted in the EZ is removed in the CRZ. Decontamination of personnel exiting the EZ will follow the steps appropriate to the specific work area.

Level D

Step 1 Remove outer gloves and suit (if used).

Step 2 Remove the hard hat and wipe it clean.

Step 3 Wash hands and face before breaks and lunch.

6.2 Suspected Skin Contamination

Any employee suspected of sustaining skin contact with chemical materials will thoroughly wash down affected areas with fresh water source and soap).

6.3 Personal Hygiene

Before any eating, smoking, or drinking, personnel will wash hands, arms, and face. Washing facilities and soap will be available in the support zone.

6.4 Equipment Decontamination

All contaminated parts of heavy equipment will be dry-boomed, or water-washed in a designated contained decontamination area within the CRZ prior to leaving the site and before exiting a defined EZ. Tools and small equipment will be similarly prior to leaving the EZ. Dry decontamination will be the primary decontamination method unless wet methods become necessary for sufficient decontamination. Rinsate will be collected and treated as contaminated waste.

6.5 Waste Handling

All liquids and disposable clothing will be treated as contaminated waste and disposed of according to the Waste Management Plan of the Work Plan. Contaminated clothing will be placed in a drum lined with a polyethylene bag pending charactorization. Wastewater generated onsite will be stored until ready for disposal. Decontamination water will be contained into 55-gallon drums pending proper disposal. All waste containers will be property labeled and stored according to regulatory requirements.

7.0 Air Monitoring

This section describes the air monitoring during the execution of the project.

Dust Monitoring
Portable real time air monitoring will be conducted for dust during excavation and packaging of excavated soils at the site. An MIE personal DataRam or equivalent will be used. If the exposures in the work zone exceed the action level of 1mg/m3, the SSO will go to the down wind perimeter and monitor. Dust concentrations at the perimeter should be less than 0.15 mg/m3, the National and Guam 24-hour ambient air quality standard for Particulate Matter 10. If this level is exceeded, dust suppression efforts will increase and additional engineering controls may be implemented.

PCB Monitoring
The highest concentration of PCBs detected at the site in the pure transformer oil is 2550 mg/kg. If PCBs were present in airborne soil at the dust action level of 1mg/m3 at a concentration of approximately 2550 mg/kg, PCBs could only be present in airborne dust at the highest possible concentration of 0.00255mg/m3 if the airborne aerosol was pure oil. This is 196 times less than the OSHA PEL level of 0.5 mg/m3 for PCB dust. Therefore, an action level of 1mg/kg for general dust at the site will be sufficiently protective of site workers.

7.1 Quality Assurance/Quality Control

Personnel will adhere to the procedures in this section to ensure a meaningful air sampling effort. The major concerns will be calibration of equipment and document control.

7.1.1 Calibration and Maintenance Procedures

The SSO will calibrate all direct-reading instruments daily, before each use.

Each instrument will be cleaned and inspected at the end of each day. The SSO will verify that any sampling train is clean and free of obstructions and that equipment is recharged during the evening as necessary. Battery function will be verified at the start of each day.

7.1.2 Documentation

Strict adherence to document and data control procedures will be required to ensure valid QA/QC. Data and calibration records must be accounted for and retrievable all times. Types of documents that will be required include the following:

- Notes
- Maps
- Logbooks
- Data sheets
- Reports

Logbooks and data sheets will be prepared which will maintain all pertinent information regarding the air-monitoring.

8.0 Emergency Response

Prior to the start of field activities, the Project Supervisor and SSO shall plan emergency egress routes and discuss them with all personnel who will be conducting the fieldwork. Initial planning will include establishing emergency warning signals and evacuation routes in case of an emergency. The site-specific emergency contingency plan will be discussed in detail at the pre-job site safety orientation meeting.

8.1 Emergency Services

A map showing directions to the designated hospital is included below which will be used for directions to transport personnel for treatment of any non-emergency injuries:

Cellular telephone service will be available at all times on site to call in any medical emergency and coordinate efficient transportation for medical treatment via 911.

The following emergency equipment will be present on the site:

- Fire extinguishers
- Industrial first aid kit
- Portable eye wash
- Wash facility
- Cellular telephone

8.2 Site Communications

Unitek will establish successful communication between field teams and contact between personnel in the work zones.

- Cellular phones and/or hand held radio

All site personnel will become familiar with both task-specific and site-wide standard and emergency communication signals at the orientation/training session held prior to the commencement of work onsite.

8.3 Medical Emergency Procedures

8.3.1 First Aid

At least two qualified first aid providers (certified in adult CPR and first aid with blood-borne pathogens training inclusive) shall be present at the work site to provide immediate care in the event of an accident or injury. Only qualified personnel shall give first aid and stabilize an individual needing assistance. Life support techniques such as administering CPR and treating life-threatening problems such as airway obstruction and shock will be given top priority.

Professional medical assistance shall be obtained at the earliest possible opportunity. To provide first-line assistance to field personnel in the event of sickness or injury, the first aid kit must be maintained on-site.

8.3.2 Minor Injury

The following procedures should be observed if a minor injury occurs:

- Contact Project Supervisor, SSO, or buddy.
- Have qualified first aid personnel treat the injury.

- Record the injury and include the name of the injured person, the nature of the injury, and the treatment given.

8.3.3 Medical Emergency

In the event of a medical emergency in which actual or suspected serious injury occurs, the following procedures shall be implemented:

- Survey the scene and determine whether the area is safe for entry.

- Remove the exposed or injured person(s) from immediate danger.

- Render first aid if necessary; decontaminate affected personnel after critical first aid is given except if giving first aid would endanger or injure responder.

- Obtain paramedic services or ambulance transport to local hospital if victim is non-responsive; even if there is no visible injury.

  -Call 911 and identify location, request medical assistance and provide name and telephone number.

  -Request assistance from emergency medical service and/or additional assistance.

- Evacuate other personnel in the work area to a safe distance until the Project Supervisor determines that it is safe for work to resume; if there is any doubt regarding the condition of the area, work shall not commence until all hazard control issues are resolved.

Any personnel requiring emergency medical attention shall be evacuated immediately from the EZ and CRZ. Personnel shall not enter the area to attempt a rescue if their own lives will be threatened. The decision to decontaminate a victim prior to evacuation will be made based on the type and severity of the illness or injury and the nature of the contaminant.

For some emergency victims, immediate decontamination may be essential to life-saving treatment. For others, decontamination may aggravate the injury or delay life-saving treatment. If decontamination does not interfere with essential treatment, it should be performed.

Use the following procedure if decontamination can be performed:

- Wash external clothing and/or cut it away.

- Wrap the victim in clean blanket or towel if necessary.

Use the following alternate procedure if decontamination cannot be performed:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.
- Alert emergency and off-site medical personnel of potential contamination; instruct them about specific decontamination procedures.
- Send site personnel familiar with the incident along with the victim.

8.3.4 Fatal Injury

If a fatal injury occurs, project personnel will take the following additional steps.

- Notify the immediate Supervisor
- Notify the Project HSM and Unitek Corporate Office, who will initiate contact with OSHA and other appropriate agencies
- Stop all work activities on the project for 24 hours
- Assist OSHA as directed

8.4 Spill Response Procedures

Work for this project involves a low potential risk of leaks of hazardous materials. Site investigations and analytical data indicate that only small amounts of these materials would be released in any such leak or spill. Because the potential for a spill exists, however, the appropriate spill response materials will be staged in the affected area.

In the event of a suspected spill of contaminated or hazardous materials, the following procedures shall be implemented:

- Determine whether a spill has occurred.
- Notify the Project Supervisor.
- Identify protective clothing or equipment required to respond.
- Contain the spill.
- Transfer material into storage container.
- Document the incident.

8.5 Site Evacuation Plan

If a large fire, explosion, or toxic vapor release occurs, the Project Supervisor will order a site evacuation, which shall be carried out as follows:

- The applicable alarm signal will be given by voice command.
- The immediate situation will be evaluated, and the downwind direction will be determined; all personnel will evacuate upwind.
- Personnel will exit through the CRZ if this can be done safely and taking off or scrubbing outer boots and removing their outer suit prior to leaving the CRZ if the situation permits.
- All personnel will assemble upwind, and a head count will be taken.
- The extent of the problem will be determined, and a response team will be dispatched in protective clothing and self-contained breathing apparatus to evacuate any missing personnel or to correct the problem.

8.6 Emergency and Hospital Information

The list of emergency telephone numbers will be on-site and is included in Attachment 1.

9.0 Training Requirements

All field employees receive annual and periodic in-house training in various health and safety topics.

9.1 40-Hour Hazardous Waste Operations Safety Training

As a prerequisite to employment, all field employees are required to take a 40-hour training class and pass a written examination. This training is comprehensive and addresses all forms of PPE. In addition, this course addresses the toxicological effects of various chemicals, handling procedures for unknown tanks and drums, confined space entry procedures, and procedures for maintaining electrical safety. This course complies fully with OSHA requirements in 29 CFR 1910.120. In addition, each employee is required to have 3 days of on-the job, supervised training. Supervisors are required to have 8 hours of additional training. All employees receive 8 hours of annual refresher training as required by the above regulations.

9.2 Site-Specific Pre-Job Safety Orientation

All personnel entering the EZ will be trained in the provisions of this SHSP and will be required to sign the SHSP acknowledgement. A site safety orientation meeting will be held to discuss the following topics:

- Names of personnel responsible for site safety
- Health and safety hazards onsite
- PPE (use and care)
- Location of safety equipment such as fire extinguishers
- Site standard operating procedures and safe work practices
- Work zones and site control measures
- Hazard communication program and MSDSs for the project
- Emergency and spill response and contingency plan
- Confined space entry procedures (when applicable)
- Hot work procedures (when applicable)

Attendance at this meeting will be documented.

9.3 Daily and Periodic Safety Training

Daily safety meetings will be held at the beginning of each day to discuss H&S problems and issues. Phase safety briefings will be held prior to beginning a new task to discuss task specific risks and precautions. Attendance is mandatory and will be documented.

10.0 Medical Surveillance Program

All employees participate in a medical and health monitoring program. This program is initiated when the employee starts work, with a complete physical and medical history, and is continued regularly. The Unitek worker medical profile includes the following:

- Medical history
- Work history
- Visual acuity and tonometry tests
- Pulmonary function tests
- Physical examination

- Audiometry tests
- Chest x-ray (initial and as required)
- Complete blood count
- Blood chemistry (SMAC-23 or equivalent)
- Urinalysis
- Dermatology examination

This program was developed in coordination with a consultant toxicologist and medical surveillance is performed under direct supervision of a qualified physician, board certified in occupational medicine.

11.0 References

American National Standards Institute. *Practice for Respiratory Protection, Z88.2 and Demolition Operation-Safety Requirements, A10.6.*

National Institute for Occupational Safety and Health/Occupational Health and Safety Administration/U.S. Coast Guard/U.S. Environmental Protection Agency. 1985. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* October.

United States Department of Labor, Occupational Safety and Health Administration (OSHA) Regulations.

-29 Code of Federal Regulations 1910.120-Hazardous Waste Operations and Emergency Response

-29 Code of Federal Regulations 1910.1200-Hazard Communication

-29 Code of Federal Regulations 1926-Safety and Health Regulations for Construction

United States Environmental Protection Agency Regulations

-40, Code of Federal Regulations Part 761

Appendix

ATTACHEMENT 1

Emergency Contact Numbers

EMERGENCY CONTACT NUMBERS

Fire/Police/Emergency Medical	**911**
Guam Memorial Hospital	**647-2330/ 647-2444**
Emergency Room Poison Control	**646-8104**
Naval Hospital	**344-9232**
EOD MU-5 DET Marianas Bomb Disposal	**339-7162**
USCG Emergency Rescue	**564-8724**
USCG Sector Guam Emergency Response	**355-4821 through 27**
National Response Center	**800 424-8802**
Guam Fire Dept Rescue Yona	**671 789 2231**
EPA Representative	
Carmin Santos	**415 972-3360**
GEPA Representative	
Don Quinata	**671 300-4768**
Country Club of the Pacific	**671 789-1361**
Hajime Ogimi Manager	**671 789-1362**
Louis Bell Superintendent	**671 687-2237**
Unitek Environmental Guam	**671 565-3151**
Project Manager	
LeRoy Moore	**Cell 671 689-4656**
Site Safety Officer	
Brad Wolfe	**671 687-1310**

ATTACHEMENT 2

Activity Hazard Analyses

TASK SET 1

MOBILIZATION, SURVEY, SITE PREPARATION

DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
Unitek Environmental Guam will Mobilize to all equipment and personnel to CCP to initially remove approximately 10 cubic yards of PCB affected concrete and soils from Country Club of the Pacific, Golf Course. The soil excavation areas will be will be laid out and work areas including the EZ, CRZ, and SZ will be identified will construction fencing and silt fencing Erosion controls will be placed consisting of silt fencing around the excavation area. Following the project after all results indicate the site has been remediated to below the clean up goals and site restoration is complete, all materials and equipment will be demobilized from the site.	None

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D Ensemble • Hard Hat • Short Sleeve Shirt • Full-length Pants • Safety-toe Boots • Hi Visibility Shirt/Vest	• First aid kit • Fire extinguisher • Eye Wash	• Slips, trips, and falls • Heat Stress • Struck by or against vehicles • high noise levels • electrical if electric tools used • heavy objects • impalement hazard (rebar markers or supports for fencing)

RECOMMENDED CONTROLS

- Slips, trips, falls - Good housekeeping, mark or barricade unsafe walking areas or other obstructions, eliminate hazard when recognized.
- To prevent heat stress - monitor workers for signs and symptoms, provide breaks as needed and supply cool drinking water
- Workers near traffic or directing heavy equipment shall wear high visibility shirt or vest, establish traffic routes, avoid equipment swing areas, make eye contact and operator acknowledgement prior to approaching equipment, all workers maintain safe distance from equipment.
- Noise- hearing protection will be worn if noise present exceeds 85dB(A) 8-hr TWA.
- Only qualified electrician work on circuits, GFCI for all power tools and inspect tools and extension cords daily.
- All rebar impalement hazards shall be covered with metal reinforced caps or eliminated.

MONITORING PROCEDURES

No monitoring required.

TASK SET 2	
PCB TRANSFORMER AND OIL REMOVAL FROM SITE AND ACCESS	
DESCRIPTION	**CHEMICAL EXPOSURE HAZARDS**
Access sufficient to remove the subject PCB transformers and PCB drums will be provided by trimming leaning trees, limbs and shrubs to provide sufficient clearance to safely remove the items from the site. The vegetation in the access roads consists of small Tangantagan trees, small shrubby species and vines whereby machetes and hand saws will be sufficient to clear the path wide enough for equipment and transformers to pass through. Transformer and drum removal from the site will be work area with the all terrain forklift, flatbed truck, and box van.	• Possible exposure to PCB's in soil if soil is disturbed in excavation zone or contact with stains on transformer surfaces. (dermal, ingestion)

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D Ensemble • Hard Hat, Short Sleeve Shirt, Full-length Pants, Safety-toe Boots • Eye protection • Hi Visibility Vest • Work gloves • Nitrile work gloves and tyvek if required	• First aid kit • Fire extinguisher (20 lb. ABC) • Emergency eye wash • Traffic cones/ barricades • Decontamination water • Cell phones	• Slips, trips, and falls • Heat Stress • Bug bits • Struck by or against vehicles • Heavy objects • Flammable fuels (equipment) • Laceration from machete or saw • Struck by tree or limb

RECOMMENDED CONTROLS

- PCBs minimize contact with stained soils, concrete pad and transformer surfaces, wear additional PPE (coveralls, gloves) decontaminate.
- Only properly trained workers (40 hr hazmat as appropriate), no eating/drinking in work area, supervision and air monitoring by competent personnel
- No personnel allergic to bee stings or other insect bits on clearing crew.
- Slips, trips, falls - Good housekeeping, mark or barricade unsafe walking areas or obstructions, eliminate hazards
- To prevent heat stress - monitor workers for signs and symptoms, provide breaks and supply cool drinking water
- Workers near equipment wear orange vest, establish traffic routes, avoid equipment swing areas, make eye contact and operator acknowledgement prior to approaching equipment.
- Noise- hearing protection will be worn if noise present exceeds 85dB(A) 8-hr TWA.
- Fire - No smoking, close flammable containers, no accumulation of combustibles, adequate fire extinguishers.
- Proper lifting techniques, limit lifting to 60 lbs
- Work gloves used with machete or saws, keep aware and clear of other workers.
- Clear all fall paths when cutting trees, plan felling carefully, use notch cuts for large trees and guy ropes if necessary.
- All heavy equipment will have overhead protection and backup alarms, spotters and qualified operators.

TASK SET 3

EXCAVATE , PACKAGE AND TRANSPORT PCB SOIL/CONCRETE FROM SITE

DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
Unitek will initially excavate approximately 10 cubic yards of PCB-impacted soil and contrete pads for disposal or treatment to eliminate the potential PCB source from the site and to mitigate potential risk to site users from exposure to contaminated surface soil. Soil will be bulk sacked, palletized and loaded onto trucks for transport to treatment/disposal sites.	• Exposure to PCBs (dermal, respiratory) • Dust

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D Ensemble • Hard Hat • Short Sleeve Shirt • Full-length Pants • Safety-toe Boots • Eye protection • Hi Visibility Vest • Nitrile work gloves • Respirator (if monitoring above action level)	• First aid kit • Fire extinguisher (20 lb. ABC) • Emergency eye wash • Traffic cones/ barricades • Decontamination station/water • Cell phones	• Slips, trips, and falls • Heat Stress • Struck by or against vehicles • High noise levels • Electrical if used • Heavy objects • Fire/Flammable materials (fuels) • Excavation hazards

RECOMMENDED CONTROLS

- Exposure to chemicals - minimize personnel contact with PCBs soils; monitor airborne dust in active loading zone to ensure levels are below 1mg/m3 action level; wear additional PPE (coveralls, gloves, respirators) as necessary when working in active excavation zone.
- Only properly trained workers (40 hr hazmat as appropriate), no eating/drinking in work area, supervision and air monitoring by competent personnel.
- Slips, trips, falls - Good housekeeping, mark or barricade unsafe walking areas or obstructions, eliminate hazard when recognized, workers and debris clear of sides of excavations.
- To prevent heat stress - monitor workers for signs and symptoms, provide breaks and supply cool drinking water
- Workers near traffic or directing heavy equipment shall wear orange vest, establish traffic routes, avoid equipment swing areas, make eye contact and operator acknowledgement prior to approaching equipment.
- Noise- hearing protection will be worn if noise present exceeds 85dB(A) 8-hr TWA.
- Only qualified electrician work on circuits, GFCI for all power tools and inspect tools and extension cords daily.
- Fire - No smoking, close flammable containers away from work area, adequate fire extinguishers.
- Proper lifting techniques, limit lifting to 60 lbs
- Excavations 4 feet or greater have access ladders/ramps access as to require no more that 25 feet lateral travel.
- Excavations greater that five feet will be sloped, benched, or shored and be tested for oxygen, flammables and site contaminants as required by competent personnel.
- Excavation walls four 4 feet or deeper will have construction fencing placed 2-6 feet back from excavation wall to prevent personnel from falling into excavations
- All heavy equipment will have overhead protection and backup alarms, spotters and qualified operators.

TASK SET 4

CHARACTERIZATION/VERIFICATION SAMPLING AND OF EXCAVATION SAMPLING LOCATIONS

DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
Following excavation to remove the obviously contaminated concrete pads and soils, characterization/verification sampling will be performed in accordance with 40 CRF 761 subparts N and O. Based on the results of sampling an analysis of soil samples, the excavation will continue until the remediation goal of less than 1 ppm is reached in all areas of the excavation. The excavated dimensions will be recorded as well as the sample locations for inclusion into the final Remedial Verification Report (RVR). Sufficient samples will be collected to properly characterize the site and verify site cleanup goals have been met. Personnel will manually collect surface soil samples using disposable sampling equipment.	• Exposure to PCBs (dermal, ingestion)

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D Ensemble • Hard Hat • Short Sleeve Shirt • Full-length Pants • Safety-toe Boots • Eye protection • Hi Visibility Vest • Nitrile work gloves (when contacting PCB soils	• First aid kit • Fire extinguisher (20 lb. ABC) • Emergency eye wash • Traffic cones/ barricades • Cell phones • Decontamination water	• Slips, trips, and falls • Heat Stress • Struck by or against vehicles or objects • High noise levels • Heavy objects • Excavation Hazards

RECOMMENDED CONTROLS

- Exposure to PCBs - minimize contact with soil, no eating/drinking in work area wear PPE and decontaminate
- Slips, trips, falls - Good housekeeping, mark or barricade unsafe walking areas and deep excavations, eliminate hazard when possible.
- To prevent heat stress - monitor workers for signs and symptoms, provide breaks as needed and supply cool drinking water
- Heavy equipment certification and daily inspection of all equipment on site, workers near traffic or directing heavy equipment shall wear orange vest, qualified operators, workers avoid equipment swing areas keep safe distance, make eye contact and operator acknowledgement prior to approaching equipment, excavations greater than 6 feet deep must be marked or barricaded no closer than 6 feet from excavation in all directions and fall protection provided for workers approaching within six feet of excavation, entry into excavations >5 feet not permitted unless properly sloped/benched or shored to the requirements of competent person, spotters for backing maneuvers.
- Proper lifting techniques, limit lifting to 60 lbs

TASK SET 5

SITE RESTORATION AND DEMOBILIZATION

DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
Upon receipt of confirmation samples indicating that Cleanup goals have been met, excavations will be filled most likely with clean borrow soil from the site or as directed from CCP management. Once excavations are filled all equipment and materials will be demobilized from the site.	None

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D Ensemble • Hard Hat • Short Sleeve Shirt • Full-length Pants • Safety-toe Boots • Hi Visibility Vest	• First aid kit • Fire extinguisher (20 lb. ABC) • Emergency eye wash • Traffic cones/ barricades • Cell phones	• Slips, trips, and falls • Heat Stress • Struck by or against vehicles • high noise levels • electrical if used • heavy objects

RECOMMENDED CONTROLS

- Slips, trips, falls - Good housekeeping, mark or barricade unsafe walking areas or other obstructions, eliminate hazard when recognized.
- To prevent heat stress - monitor workers for signs and symptoms, provide breaks as needed and supply cool drinking water
- Workers near traffic or directing heavy equipment shall wear orange vest, establish traffic routes, avoid equipment swing areas, make eye contact and operator acknowledgement prior to approaching equipment, all workers maintain safe distance from equipment.

MONITORING PROCEDURES

No monitoring required.

ATTACHEMENT 3

Safety Plan Acknowledgement Sheet

SAFETY PLAN ACKNOWLEDGEMENT SHEET

This is to certify that I have read the Site Safety Plan and understand its contents. Failure to comply with the requirements contained in this plan may result in disciplinary action, including removal from this project.

PRINT NAME	SIGNATURE	DATE